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OFFICIAL GAZETTE of the
UNITED STATES PATENT AND TRADEMARK OFFICE

December 10, 1985 Volume 1061 Number 2

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.50 each; PLANT PATENTS in color, $6.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1052 O.G. 52 on Mar. 26, 1985.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Certain domestic fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

The Search fee of the European Patent Office has been changed as of Oct. 12, 1985 and is announced in the *Official Gazette* at 1058 O.G. 26 on Sept. 24, 1985.

International PCT fees have been changed effective Oct. 29, 1985 and were announced in the *PCT Gazette* on Aug. 29, 1985 and in the *Official Gazette* at 1058 O.G. 26 on Sept. 24, 1985.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
—No corresponding prior U.S. national application filed:	420.00
—Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority, all cases	750.00
International fees	
Basic fee (first 30 pages):	280.00
Basic Supplemental fee (for each page over 30):	6.00
Designation fee for the first 10 national or regional offices:	70.00
Designation fee for 11th and subsequent designations	No charge

DONALD J. QUIGG,
Oct. 21, 1985. *Assistant Secretary and Commissioner of Patents and Trademarks.*

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Oct. 5, 1985. If the maintenance fee is not paid in a patent requiring such payment, the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on Dec. 7, 1982 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,361,912 through 4,363,139
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), as amended effective Oct. 5, 1985, which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 225.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:
By a small entity (§1.9(f)) . . . . . $ 225.00
By other than a small entity . . . . . $ 450.00"

The amounts of the surcharges, as amended effective Oct. 5, 1985, are set forth in 37 CFR 1.20 (k) and (l), which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 110.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:
By a small entity (§1.9(f)) . . . . . $ 55.00
By other than a small entity . . . . . $ 110.00"

Section 1.20 paragraph (m) as amended as a result of enactment of Public Law 98–622 effective Nov. 8, 1984, is reproduced below:

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,411,783, Re. S.N. 791,376, Filed Oct. 25, 1985, Cl. 210/304, ARTERIAL BLOOD FILTER WITH IMPROVED GAS VENTING, Duane D. Dickens, et al., Owner of Record: *Shiley, Inc., Irvine, Calif.,* Attorney or Agent: Louis J. Knobbe, et al., Ex. Gp.: 136

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

3,440,973, Reexam. No. 90/000,883, Requested: Oct. 11, 1985, Cl. 99/483, PROOFERS FOR BREAD PRODUCTS AND CONVEYOR SYSTEMS WHICH ARE ADAPTED TO USE THEREIN, William E. Lanham, et al., Owner of Record: *Inventors, Decatur, Ga.,* Attorney or Agent: Curtis, Morris, et al., Ex. Gp.: 240, Requester: Stewart Systems, Inc., Plano, Tex.

3,680,493, Reexam. No. 90/000,884, Requested: Oct. 11, 1985, Cl. 34/207, CONVEYOR SYSTEM, William E. Lanham, et al., Owner of Record: *Inventors, Decatur, Ga.,* Attorney or Agent: Curtis, Morris, et al., Ex. Gp.: 340, Requester: Stewart Systems, Inc., Plano, Tex.

3,900,886, Reexam. No. 90/000,888, Requested: Oct. 18, 1985, Cl. 358/82, SONIC COLOR SYSTEM, Jan R. Coyle, et al., Owner of Record: *Inventor,* Attorney or Agent: Newton H. Lee, Jr., Ex. Gp.: 260, Requester: Atari Holdings, Inc., New York, N.Y.

4,039,304, Reexam. No. 90/000,893, Requested: Nov. 1, 1985, Cl. 55/10, METHOD OF REMOVING SO_2 AND/OR OTHER ACID COMPONENTS FROM WASTE GASES, Horst Bechthold, et al., Owner of Record: *Buckau-Walther AG, Cologne, Germany,* Attorney or Agent: Kenyon & Kenyon, Ex. Gp.: 130, Requester: Industrial Resources, Inc., Lakewood, Colo.

4,220,283, Reexam. No. 90/000,894, Requested: Oct. 30, 1985, Cl. 239/205, VEGETATION SPRINKLER HAVING A HAND ADJUSTMENT TO DIRECT THE SPRAY, Manning Citron, Owner of Record: *Champion Brass Mfg. Co., Los Angeles, Calif.,* Attorney or Agent: Harlan Huebner, Ex. Gp.: 310, Requester: Owner

4,278,635, Reexam. No. 90/000,895, Requested: Oct. 31, 1985, Cl. 422/14, METHOD FOR DEOXYGENATION OF WATER, Herman Kerst, Owner of Record: *Dearborn Chemical Co., Lake Zurich, Ill.,* Attorney or Agent: William W. McDowell, Jr., Ex. Gp.: 130, Requester: Betz Laboratories, Inc., Trevose, Pa.

4,359,501, Reexam. No. 90/000,891, Requested: Oct. 28, 1985, Cl. 428/420, HYDROLYSIS RESISTANT POLYARYLETHERKETONE FABRIC, Venanzio Di Tullio, Owner of Record: *Albany International Corp., Appleton, Wis.,* Attorney or Agent: Donald G. Casser, Ex. Gp.: 150, Requester: Asten Group, Inc., Devon, Pa.

4,381,639, Reexam. No. 90/000,885, Requested: Oct. 11, 1985, Cl. 57/229, SHEATH-CORE YARN FOR SEVERE THERMAL PROTECTING FABRIC AND METHOD THEREFOR, Robert R. Kress, Owner of Record: *Record Industrial Co., King of Prussia, Pa.,* Attorney or Agent: Alan Ratner, Requester: Amatex Corp., Norristown, Pa.

4,404,040, Reexam. No. 90/000,886, Requested: Oct. 11, 1985, Cl. 134/22.14, SHORT CHAIN FATTY ACID SANITIZING COMPOSITIONS AND METHODS, Yueh Wang, Owner of Record: *Economics Laboratory, Inc., St. Paul, Minn.,* Attorney or Agent: Mark DiPietro, Ex. Gp.: 130, Requester: Diversey Wyandotte Corp., Wyandotte, Mich.

4,462,482, Reexam. No. 90/000,887, Requested: Oct. 15, 1985, Cl. 180/230, MOTORIZED TWO-WHEELED VEHICLE, Masaharu Tsubai, Owner of Record: *Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan,* Attorney or Agent: Armstrong, Nikaido, et al., Ex. Gp.: 310, Requester: Owner

4,521,827, Reexam. No. 90/000,889, Requested: Oct. 23, 1985, Cl. 361/386, HEAT SINK MOUNTING, William D. Jordan, et al., Owner of Record: *Thermalloy, Inc., Dallas, Tex.,* Attorney or Agent: Richards, Harris, et al., Ex. Gp.: 320, Requester: Penn Engineering Mfg. Corp., Danboro, Pa.

Change to the Processing Period for Trademark Registrations Issued

The processing period between publication for opposition and registration will be changed from 10 weeks to 12 weeks beginning with applications published for opposition on Oct. 15, 1985. Therefore, from Oct. 15, 1985 onward, trademark applicants can expect to receive a registration 12 weeks after the mark is published for opposition so long as an opposition or request for extension of time to oppose is not filed against their application.

As a result of the change from a 10-week to a 12-week processing period, few if any registrations will issue in the Dec. 24, 1985 and Dec. 31, 1985 Trademark Official Gazettes.

Oct. 29, 1985. MARGARET M. LAURENCE,
Assistant Commissioner, for Trademarks.

Notice of Examination for Registration Tuesday, April 8, 1986

Pursuant to the provisions of 37 C.F.R. §§10.5, 10.6 and 10.7, an examination for persons seeking registration before the United States Patent and Trademark Office as patent attorneys and agents will be held on *Tuesday, Apr. 8, 1986.* The deadline for filing applications along with the $250 fee and all necessary showings required by 37 CFR §§7(a) and (b) is *Jan. 31, 1986.*

With the exception of those persons who actively served four years in the examining corps of the Patent and Trademark Office for whom the examination is waived, all persons recognized for practice before the Patent and Trademark Office in patent cases must pursuant to the noted rules, pass the examination. Note: those passing the examination do not qualify for recognition for practice before the Patent and Trademark Office in trademark cases. Recognition for practice in trademark cases is governed by 37 C.F.R. §10.14, which does not require the passing of an examination.

37 C.F.R. §10.6(d) provides, in part, that, "[A]ny officer or employee of the United States who is disqualified by statute (18 U.S.C. 203, 205) from practicing as an attorney or agent in proceedings or other matters before Government departments or agencies, may not be registered to practice before the Office... [but,] an officer or employee whose official duties require the preparation and prosecution of applications for patent and who fulfills the requirements of... [Part 10 of 37 CFR] may be registered to practice before the Office to the extent necessary to carry out his or her official duties." If a person is an officer or employee of the United States who is not disqualified for registration under 37 C.F.R. §10.6(d) when that person applies to take the examination, that person's application for registration *must* be accompanied by his or her supervisor's *verified statement* that his or her official duties as a United States officer or employee require him or her to prepare and prosecute applications for patent. If, after applying, a person becomes an officer or employee of the United States, and is not disqualified for registration under 37 C.F.R. §10.6(d), that person must submit the same verified state-

ment from his or her supervisor, preferably promptly upon his or her employment.

If a person who is an officer or employee of the United States is disqualified from registration under 37 C.F.R. §10.6(d) at the time he or she applies for admission to the examination, or becomes so disqualified after applying, but before he or she is registered, registration of such person will be subject to the following conditions:

1. If the person is serving in the patent examining corp of the Patent and Trademark Office (PTO) or as a law clerk or technical advisor in the Court of Appeals for the Federal Circuit (CAFC) and passes the examination, that person will not be registered so long as he or she remains employed by the PTO or CAFC. However, if within one (1) year from the date of termination of employment with the PTO or CAFC that person's status changes and he or she is no longer disqualified under 37 CFR §10.6(d), that person will be considered eligible for registration upon satisfactory proof of his or her change in status. If that person has not become registered within one (1) year from the date of termination of employment with the PTO or CAFC, that person may not become registered thereafter except upon taking and passing another regularly scheduled examination unless such person has served more than four years in the examining corps of the PTO.
2. If the person passes the examination and is employed by the U.S. Government in an agency or branch other than the PTO or CAFC, that person will not be registered so long as he or she remains disqualified for registration under 37 CFR §10.6(d). However, if within one (1) year from the date notification of passing the examination is mailed, that person's status changes and he or she is no longer disqualified under 37 CFR §10.6(d), that person will be considered eligible for registration upon satisfactory proof of his or her change in status. If a person has not become registered within one (1) year from the date notification of passing the examination is mailed, that person may not become registered thereafter except upon taking and passing another regularly scheduled examination.

Under 37 CFR §10.7(b), persons seeking registration must submit "satisfactory proof of good moral character and repute and of sufficient basic training in scientific and technical matters...." The initial submissions of many persons not having degrees in physics, chemistry and engineering are inadequate, and often they must be supplemented before such persons are approved to take the examination. To afford adequate time to present a satisfactory supplemental showing, it is recommended that persons file their applications early, preferably *at least two months* before the Jan. 31, 1986 deadline. All supplemental showings of qualifications and all applications received after Jan. 31, 1986 will be considered in connection with their admission to the next succeeding examination.

The examination will be given under the supervision of the Office of Personnel Management and may be taken at specific locations in which the Office of Personnel Management conducts examinations.

Application blanks may be obtained from the Office of Enrollment and Discipline, Bldg. 3, 10th Floor, Rm. D23, Crystal Plz., Arlington, Va. or by mail addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231, and directed to the attention of the Office of Enrollment and Discipline.

CAMERON WEIFFENBACH,
Nov. 18, 1985. *Director, Office of Enrollment and Discipline.*

Patents Available for License or Sale

General Electric Co. is prepared to grant nonexclusive licenses under the following patent upon reasonable terms to domestic manufacturers.

Applications for license under the following patents should be addressed to: Division Patent Counsel, Power Delivery Division, General Electric Co., 1016 W. Ninth Ave., King of Prussia, Pa. 19406.

4,387,280. HIGH SPEED HYDRAULICALLY-ACTUATED OPERATING SYSTEM FOR AN ELECTRIC CIRCUIT BREAKER.

4,398,255. POLYPHASE ANGLE ESTIMATOR.

4,409,477. GAS BLAST CIRCUIT BREAKER COMBINING A MAGNETICALLY DRIVEN ROTATING ARC AND A PUFFER INDUCED GAS BLAST.

4,410,456. ADDITIVES FOR ENHANCING CORONA STABILIZATION IN ELECTRONEGATIVE GASES.

4,410,585. LAYER INSULATION FOR USE IN HIGH VOLTAGE ELECTRICAL EQUIPMENT.

4,433,221. IMPEDANCE CONTACT ASSEMBLY FOR AN ELECTRIC CIRCUIT BREAKER.

4,459,629. ELECTRIC CIRCUIT BREAKER UTILIZING SEMICONDUCTOR DIODES FOR FACILITATING INTERRUPTION.

4,511,203. DEVICE FOR PROVIDING ATTACHMENT TO SPACED PARALLEL CABLES OR RODS.

4,522,771. METHOD OF FABRICATING LAYER INSULATION FOR USE IN HIGH-VOLTAGE ELECTRICAL EQUIPMENT.

4,479,104. TRANSFORMER CORE HAVING CHARGE DISSIPATION FACILITY.

4,484,247. NONFRAGMENTING STATION ARRESTER.

4,495,459. SURGE ARRESTER DISCHARGE COUNTING APPARATUS.

3,468,117. POSITIVE DRIVE CONTINUOUS GEAR-MESH SHIFTING MULTISPEED TRANSMISSION SYSTEM. *Laszlo J. Kiss,* 7044 Paige, Warren, Mich. 48091, 313–756–1137.

3,659,479. POSITIVE CONTINUOUSLY CONSTANT GEAR-MESH SPEED CHANGE SYSTEM FOR PLANETARY DRIVE SYSTEMS AND THE LIKE. *Laszlo J. Kiss,* 7044 Paige, Warren, Mich. 48091, 313–756–1137.

3,886,809. POSITIVE DRIVE CONTINUOUS GEAR-MESH SHIFTING TRANSMISSIONS. *Laszlo J. Kiss,* 7044 Paige, Warren, Mich. 48091, 313–756–1137.

4,126,214. POSITIVE ONE-WAY CLUTCH SYSTEM. *Laszlo J. Kiss,* 7044 Paige, Warren, Mich. 48091, 313–756–1137.

4,461,084. INTERNAL MEASURING GAUGE. *Roger K. Slocum,* c/o Boone, Fox & Jones, P.O. Box 865, Los Altos, Calif. 94023–0865.

4,466,245. POWER PLANT HAVING A FLUID POWERED FLYWHEEL. *Frank G. Arold,* 145 Hillcrest Blvd., Ypsilanti, Mich. 48197.

4,513,534. SHUTTER FOR VENTILATION SYSTEMS. *Peter K. Kontler,* One Landmark Sq., Stamford, Conn. 06901.

4,519,744. TURBINE POWER PLANT. *Frank G. Arold,* 145 Hillcrest Blvd., Ypsilanti, Mich. 48197.

4,532,410. LOW VOLTAGE BATTERY OPERATED HEATING BIB. *Betty Wehmeyer,* P.O. Box 118, Ingram, Tex. 78025.

PATENT NOTICES

Certificates of Correction for the Week of Dec. 10, 1985

D. 279,775	4,481,961	4,517,665	4,534,865
Re. 31,939	4,482,325	4,518,416	4,534,958
Re. 31,988	4,485,484	4,518,694	4,535,096
3,690,537	4,485,620	4,519,825	4,535,206
4,274,786	4,486,319	4,520,145	4,535,864
4,312,821	4,487,472	4,520,209	4,535,984
4,333,236	4,488,605	4,520,221	4,536,261
4,337,301	4,489,097	4,520,305	4,536,447
4,412,098	4,489,500	4,521,128	4,536,931
4,416,365	4,494,616	4,521,780	4,537,888
4,417,706	4,498,937	4,522,543	4,538,266
4,421,363	4,499,541	4,523,560	4,538,340
4,422,148	4,499,606	4,525,498	4,538,382
4,425,520	4,500,718	4,525,546	4,538,507
4,425,621	4,503,783	4,525,577	4,538,515
4,427,452	4,506,043	4,527,647	4,539,030
4,444,770	4,506,072	4,528,197	4,539,212
4,451,556	4,507,290	4,528,306	4,539,352
4,451,685	4,507,298	4,528,522	4,539,427
4,459,600	4,507,612	4,528,527	4,539,996
4,460,264	4,508,532	4,528,784	4,540,111
4,461,072	4,508,584	4,530,012	4,540,199
4,463,508	4,508,989	4,530,460	4,540,906
4,466,181	4,513,435	4,530,816	4,541,002
4,467,353	4,513,700	4,532,000	4,541,126
4,468,233	4,515,452	4,532,130	4,541,636
4,469,508	4,515,482	4,532,300	4,541,843
4,470,125	4,515,991	4,532,610	4,541,983
4,471,802	4,516,239	4,533,394	4,542,225
4,472,727	4,516,287	4,533,660	4,542,509
4,474,349	4,516,344	4,533,820	4,543,159
4,477,179	4,516,521	4,534,412	4,543,355
4,478,820	4,516,899	4,534,414	4,543,538
4,481,202	4,517,160	4,534,581	4,544,280
4,481,753	4,517,190	4,534,672	4,544,459

Disclaimers

3,484,467.—*Peter Vincent Susi,* Middlesex and *Norman Ann Weston,* Somerville, N.J. DIARYL-(N,N,-DIARYLAMINOARYL)-AMINIUM HEXAFLUOROANTIMONATES AND HEXAFLUOROARSENATES. Patent dated Dec. 16, 1969. Disclaimer filed Sept. 9, 1985, by the assignee, *American Cyanamid Co.*

Hereby enters this disclaimer to claims 1 and 4 of said patent.

3,670,025.—*Peter Vincent Susi,* Middlesex and *Norman Ann Weston,* Somerville, N.J. N, N, N',N'-TETRAKIS-(P-DI ACYCLIC HYDROCARBYL-AMINOPHENYL)-P-ARYLENEDIAMINE. Patent dated June 13, 1972. Disclaimer filed Sept. 9, 1985, by the assignee, *American Cyanamid Co.*

Hereby enters this disclaimer to claims 1 and 4 of said patent.

4,129,491.—*Joseph O. Obiaya,* Warrensville Heights, Ohio. OXYGEN CONCENTRATION ANALYZER. Patent dated Dec. 12, 1978. Disclaimer filed Sept. 23, 1985, by the *inventor.*

The term of this patent subsequent to Dec. 5, 1995, has been disclaimed.

4,255,612.—*Michael A. Grundfest,* Forest Hills, N.Y. INSULATOR FOR COVERING ELECTRIC CABLES. Patent dated Mar. 10, 1981. Disclaimer filed Oct. 10, 1985, by the assignee, *Thomas & Betts Corp.*

Hereby enters this disclaimer to claims 35 through 37 of said patent.

4,467,932.—*Robert M. Dabich,* Garden Grove Calif. EASY LIFT PIT LID. Patent dated Aug. 28, 1984. Disclaimer filed Oct. 1, 1985, by the *inventor.*

Hereby enters this discalimer to claims 10, 11, 12, 13, 15, 16, 17 and 18 of said patent.

Dedication

3,720,341.—*Walter Greenfield,* Ardsley and *Raymond Berg,* Mount Vernon, N.Y. RESEALABLE HERMETICALLY SEALED AMPULES AND CLOSURE THEREOF. Patent dated Mar. 13, 1973. Dedication filed Sept. 4, 1985, by the assignee, *Cooper Laboratories, Inc.*

Hereby dedicates to the Public the remaining term of said patent.

Disclaimers and Dedications

3,610,237.—*Clare E. Barkalow,* Comstock Park, and *Ilden R. Folkerth,* Sparta, Mich. INHALATION POSITIVE PRESSURE BREATHING APPARATUS. Patent dated Oct. 5, 1971. Disclaimer and Dedication filed Sept. 25, 1985, by the assignee, *Michigan Instruments, Inc.*

Hereby disclaims and dedicates to the public all claims of said patent.

3,662,751.—*Clare E. Barkalow,* Comstock Park and *Ilden R. Folkerth,* Sparta, Mich. AUTOMATIC RESPIRATOR-INHALATION THERAPY DEVICE. Patent dated May 16, 1972. Disclaimer and Dedication filed Sept. 26, 1985, by the assignee, *Michigan Instruments, Inc.*

Hereby disclaims and dedicates to the Public all claims of said patent.

4,340,824.—*Mark L. Shaw,* Mesa, Ariz. AUXILIARY STEERING WHEEL COMMAND SYSTEM. Patent dated July 20, 1982. Disclaimer and Dedication filed Oct. 2, 1985, by the assignee, *Motorola, Inc.*.

Hereby disclaims and dedicates to the Public all claims of said patent.

4,499,187.—*Gary R. Blackburn,* Washington's Crossing, Pa., *Carl R. Mackerer,* Pennington, N.J., and *Ceinwen A. Schreiner,* Newtown, Pa. METHOD FOR EVALUATING MUTAGENI CITY. Patent dated Feb. 12, 1985. Disclaimer and Dedication filed Oct. 1, 1985, by the assignee, *Mobil Oil Corp.*

Hereby disclaims and dedicates to the Public the entire remaining term of said patent.

SUBMISSION OF DRAWINGS

Submission of Drawings - As further clarification of the O.G. Notice of October 29, 1985, drawings for patent applications do not need to be submitted on bristol board.

Since corrections are now the responsibility of applicants, it is more convenient for the original drawings to be kept in their possession. Copies only need to be supplied to the Patent and Trademark Office. Whether or not bristol board is used for the copies is the applicant's choice. However, the copies that are submitted to the Office must be on strong, white, smooth, and non-shiny paper. High quality copies are necessary not only for the patent examination process, but for printing purposes.

If corrections are necessary, they should be made to the original drawings. Either a good copy of the corrected drawings or the corrected original can then be submitted after the Notice of Allowability is mailed.

We will be revising 37 CFR to clarify the requirements for drawing submissions.

This change is being made for the convenience of applicants and attorneys.

November 25, 1985

Theresa A. Brelsford
Assistant Commissioner
for Administration

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Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
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	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
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Texas	Austin: McKinney Engineering Library, University of Texas	(512) 471-1610
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Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

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*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF November 9, 1985

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	3-14-84
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	2-15-84
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	4-12-84
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	3-01-85
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	9-30-83
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	3-21-83
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	11-21-83
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—E. E. KUBASIEWICZ, Director	6-15-84
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director	3-28-83
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	8-30-83
DESIGN, GROUP 290—K. L. CAGE, Director	3-14-83
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	7-12-83
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	8-29-83
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	3-14-83
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	10-19-83
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	10-02-84

Expiration of patents: The patents within the range of numbers indicated below expire during October 1985, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents . . . . . Numbers 3,408,657 to 3,413,655, inclusive

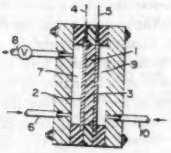
Plant Patents . . . . . Numbers 2,844 to 2,846 inclusive

REEXAMINATIONS

DECEMBER 10, 1985

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 3,489,670 (427th)
PROCESS FOR GAS PURIFICATION
Henri J. R. Maget, Swampscott, Mass., assignor to General Electric Company
Reexamination Request No. 90/000,722, Feb. 8, 1985.
Reexamination Certificate for Patent No. 3,489,670, issued Jan. 13, 1970, Ser. No. 385,925, Jul. 29, 1964.
Int. Cl.[4] C25B *1/04*
U.S. Cl. 204—129



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **3** and **5–7** is confirmed.

Claims **1**, **2** and **4** are cancelled.

5. A process of obtaining relatively pure oxygen comprising

bringing an oxygen containing gas stream into contact with a catalytically active cathode ionically conductively associated with a catalytically active anode through a polymeric cation exchange electrolyte,

establishing an electrical potential between the electrodes,

reacting hydrogen ions from the cation exchange electrolyte with oxygen at the cathode to produce water,

dissociating water into oxygen and hydrogen ions at the anode faster than water can diffuse to the anode from the cathode through the polymeric cation exchange electrolyte, and

supplying water to the anode to replace the water which is dissociated.

B1 3,825,754 (428th)
DUAL SPECTRUM INFRARED FIRE DETECTION SYSTEM WITH HIGH ENERGY AMMUNITION ROUND DISCRIMINATION
Robert J. Cinzori, and Gerald F. Stapleton, both of Santa Barbara, Calif., assignors to Santa Barbara Research Center, Goleta, Calif.
Reexamination Request No. 90/000,623, Sep. 11, 1984.
Reexamination Certificate for Patent No. 3,825,754, issued Jul. 23, 1974, Ser. No. 381,814, Jul. 23, 1973.
Int. Cl.[4] G08B *17/12*; G01J *5/00*
U.S. Cl. 250—338

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1** and **13** are determined to be patentable as amended.

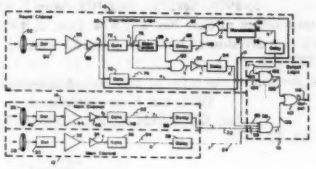
Claims **2–12** and **14**, dependent on an amended claim, are determined to be patentable.

New claims **15–18** are added and determined to be patentable.

1. A system for making energy dissipation comparisons while detecting fires and explosions above predetermined power thresholds within predetermined time periods including:

a. low threshold radiation channel means responsive to minimum power fires or explosions for generating output enable signals,

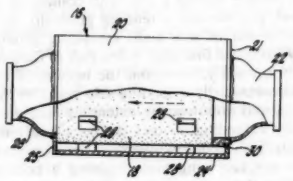
b. high threshold radiation channel means responsive to fires



or explosions which exceed a predetermined energy threshold for generating inhibit signals of a predetermined time duration or durations *in at least partially overlapping time relationship with said enable signals*, and

c. output logic gate means coupled to both said low and high threshold radiation channel means for receiving both said enable and inhibit signals, said output logic means being operative to generate an output fire control or suppression signal after the removal of said inhibit signals therefrom, whereby relatively short lived fires or explosions within the time duration of said inhibit signals are prevented from triggering an output fire detection or control signal.

B1 3,966,419 (429th)
CATALYTIC CONVERTER HAVING MONOLITH WITH MICA SUPPORT MEANS THEREFOR
Rodger E. Bloomfield, Linden, Mich., assignor to General Motors Corporation, Detroit, Mich.
Reexamination Request No. 90/000,726, Feb. 25, 1985.
Reexamination Certificate for Patent No. 3,966,419, issued Jun. 29, 1976, Ser. No. 524,486, Nov. 18, 1974.
Int. Cl.[4] F01N *3/28, 7/16*
U.S. Cl. 422—179



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–7** is confirmed.

1. A catalytic converter comprising a housing, a monolithic catalyst element disposed within said housing, said catalyst element having a rate of thermal expansion less than said housing, and support means disposed between said catalyst element and said housing for providing supporting and immobilizing forces therebetween, said support means being formed of mica having a rate of thermal expansion greater than said housing to thereby provide increasing supporting and immobilizing forces between said catalyst element and said housing as the temperature of said converter increases.

B1 4,156,999 (430th)

BEAM FOR CONCRETE FORMING STRUCTURES

Peter J. Avery, Toronto, Canada, assignor to Aluma Building Systems, Inc., Ontario, Canada

Reexamination Request Nos. 90/000,452, Oct. 4, 1983 and 90/000,511, Feb. 27, 1984.

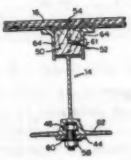
Reexamination Certificate for Patent No. 4,156,999, issued Jun. 5, 1979, Ser. No. 902,103, May 2, 1978.

Continuation of Ser. No. 422,874, Dec. 3, 1973, abandoned, which is a division of Ser. No. 204,132, Dec. 2, 1971, Pat. No. 3,787,020.

The portion of the term of this patent subsequent to Jan. 22, 1991, has been disclaimed.

Int. Cl.[4] **E04H** *12/34;* **E04B** *5/00*

U.S. Cl. 52—376



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1** and **2** is confirmed.

1. An extruded unitary aluminum beam of uniform cross-section, having a base portion, an inverted top hat portion, and a centrally located web portion between said base and top hat portions;

said inverted top hat portion presenting an open channel portion along the entire length of said beam and having a bottom wall connected centrally to said web portion and extending generally perpendicular thereto, side walls extending upwardly from said bottom wall; and a load-supporting portion of said beam consisting of a pair of flanges extending laterally outwardly, one from the top of each of said side wall;

said base portion having a first wall connected centrally to said web portion and extending generally perpendicular thereto, a pair of side walls extending generally downwardly from said first wall, a first pair of flanges extending laterally inwardly, one from the bottom of each of said pair of downwardly extending side walls, so that said first wall and said downwardly extending side walls and said inwardly extending flanges define a centrally disposed generally T-shaped downwardly open slot, said slot being suitable for receiving and retaining a bolt head while permitting the shank of the bolt to project downwardly from the open slot; and a pair of base flanges extending laterally outwardly, one from the bottom of each said pair of downwardly extending side walls and defining a load-transmitting side of said beam;

said web portion of said beam being formed between said base and top hat portions so as to be able to transfer load forces from the load-supporting portion of said beam to said load-transmitting side of said beam, at any point along the length of said beam;

wherein the width and height of said channel presented by said inverted top hat portion are each substantially greater than the width and height, respectively, of said T-shaped slot;

the thickness of said top hat flanges in the direction towards said base portion being greater than the thickness of the side walls of said open channel portion of said inverted top hat portion;

the overall distance between the outer extremities of said base flanges being greater than the overall distance between the outer extremities of said top hat flanges; and wooden beam-stiffening joist means suitable for receiving driveable fastening means and having a substantially rectangular cross-section with a cross-wise dimension substantially equal to the average spacing between said side walls of said open channel portion of said inverted top hat portion, said beam-stiffening joist means being force fitted into said open channel portion of said top hat portion and being mounted in and extending throughout the length of said open channel and being secured in said open channel by driveable means passing through said projecting inwardly from at least one of said side walls of said open channel portion, so as to thereby preclude the inadvertent removal of said beam-stiffening joist means from said open channel portion;

the height of said wooden beam-stiffening joist means having as a maximum limitation the height of said side walls of said open channel portion of said top hat portion.

B1 4,249,281 (431st)

SELF-PROPELLED VACUUM CLEANER

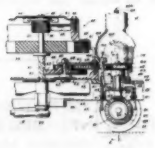
Robert B. Meyer; Harold W. Schaefer, and Richard E. Kronmiller, all of Bloomington, Ill., assignors to National Union Electric Corporation, Greenwich, Conn.

Reexamination Request No. 90/000,495, Jan. 31, 1984.

Reexamination Certificate for Patent No. 4,249,281, issued Feb. 10, 1981, Ser. No. 61,677, Jul. 30, 1979.

Int. Cl.[4] **A47L** *9/00*

U.S. Cl. 15—340



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **3**, **4**, and **6–11** is confirmed.

Claims **1**, **2** and **5** are cancelled.

[1. In a ground treatment apparatus having a body portion with ground engaging wheels and a motor, and an elongated handle pivoted to said body portion for manual manipulation of said apparatus, and wherein coupling means are provided for coupling said motor to said wheels, manually operable control means are provided on said handle, and linking means are provided for controlling said first coupling means in response to said control means, the improvement wherein said coupling means comprises a common drive shaft for said

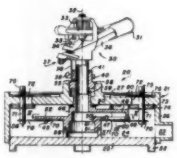
wheels, first and second spaced apart gears having first and second drive faces respectively and being freely rotatably mounted on said shaft and coupled to said motor for continuous rotation in opposite rotational directions, and first and second clutch plates rotatable with said shaft and axially slidable thereon, said first and second clutch plates being positioned to be moved into and out of engagement with said first and second drive faces respectively, whereby only one of said faces can engage the respective clutch plates at any time and the clutch plates can be positioned at a neutral position with neither of them engaging its respective face, said linking means being a mechanical coupling and comprising means for selectively moving said clutch plates to engage said drive faces under the continuous control of said manually operable control means.]

B1 4,281,793 (432nd)

WATER SPRINKLER WITH FLAT PLATE PATTERN CONTROL

Robert E. DeWitt, 49 Sherwick Rd., Oswego, Ill. 60543

Reexamination Request No. 90/000,245, Aug. 23, 1982.
Reexamination Certificate for Patent No. 4,281,793, issued Aug. 4, 1981, Ser. No. 115,263, Jan. 25, 1980.
Continuation-in-part of Ser. No. 51,861, Jun. 25, 1979, Pat. No. 4,269,354, which is a continuation-in-part of Ser. No. 893,268, Apr. 5, 1978, Pat. No. 4,180,210.
Int. Cl.[4] B05B *3/06*
U.S. Cl. 239—11



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **2–16**, **18** and **19** is confirmed.

Claims **1** and **17** are cancelled.

[**17**. A method of spraying water in a desired pattern of ground coverage using a vertical-axis sprinkler with a rotating spray head, comprising the steps:

aligning, with a radial direction of a spray of water from said spray head to said pattern, a radially-extending sampling aperture formed in a horizontal disk rotating with said spray head, the sampling aperture having a circumferentially enlarged width at radially outward portions;

passing a flow of water through said sampling aperture from a source of water to said spray head; and

blocking said flow of water through a selected, radially outward portion of said aperture in at least a part of an arc of rotation of said spray head, the unblocked portion at each circumferential position of the spray head and sampling aperture being in direct relation to the corresponding radius of the pattern of ground coverage desired in said part of said arc, such that the shape of the unblocked portion is geometrically substantially identical in shape to the pattern of ground coverage desired in said part of said arc.]

18. A method of spraying water as defined in claim **17**, further comprising the steps:

adjustably fixing a plate in said sprinkler in facially sealing relation to said disk, the plate having an edge and a face which are swept by the sampling aperture as the spray head rotates; and

adjusting and readjusting the position of the edge of said plate in the sprinkler to correspond to the distance and/or the angular orientation of a corresponding side edge of the pattern of ground coverage desired.

B1 4,446,113 (433rd)

BENZOPYRANS

John M. Evans, Roydon; Robin E. Buckingham, Welwyn Garden, and Kenneth Willcocks, Harlow, all of England, assignors to Beecham Group p.l.c., England

Reexamination Request No. 90/000,752, Apr. 3, 1985.
Reexamination Certificate for Patent No. 4,446,113, issued May 1, 1984, Ser. No. 423,450, Sep. 24, 1982.
Claims priority, application United Kingdom, Sep. 25, 1981, 8129064; Mar. 4, 1982, 8206400; Apr. 8, 1982, 8210490
Int. Cl.[4] A61K *31/35, 31/33;* **C07D** *405/04, 311/68*
U.S. Cl. 514—320

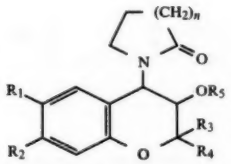
AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–20** is confirmed.

Claim **23** is cancelled.

Claims **21**, **22**, **24** and **25** are determined to be patentable as amended.

1. A compound of formula (I):



(I)

wherein:

one of R_1 and R_2 is hydrogen and the other is selected from the class of alkylcarbonyl, alkoxycarbonyl, alkylcarbonyloxy, alkylhydroxymethyl, nitro, cyano, chloro, trifluoromethyl, alkylsulphinyl, alkylsulphonyl, alkoxysulphinyl, alkoxysulphonyl, alkylcarbonylamino, alkoxycarbonylamino, or aminosulphinyl, aminosulphonyl or aminocarbonyl, the amino moiety being optionally substituted by one or two alkyl groups, or alkylsulphinylamino, alkylsulphonylamino, alkoxysulphinylamino or alkoxysulphonylamino, or ethylenyl terminally substituted by alkylcarbonyl, nitro or cyano or —C(alkyl)NOH or —C(alkyl)NNH_2, the alkyl groups or alkyl moieties of alkyl-containing groups having from 1 to 6 carbon atoms;

one of R_3 and R_4 is hydrogen or alkyl having from 1 to 4 carbon atoms and the other is alkyl having from 1 to 4 carbon atoms, or R_3 and R_4 together with the carbon atom to which they are attached are spiroalkyl having from 3 to 6 carbon atoms;

R_5 is hydrogen, alkyl having from 1 to 3 carbon atoms or carboxylic acid having from 1 to 8 carbon atoms; and

n is 1 or 2; the lactam group being trans to the OR_5 group.

13. A method of treatment of hypertension in mammals, which comprises administering an anti-hypertensive effective amount of a compound of formuls (I) according to claim **1** to a mammal in need thereof.

REISSUES

DECEMBER 10, 1985

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

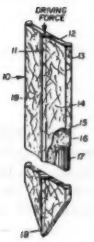
Re. 32,045
ROADWAY/TRAFFIC DELINEATOR

Donald W. Schmanski, P.O. Box 1298, Carson City, Nev. 89701

Original No. 4,092,081, dated May 30, 1978, Ser. No. 812,643, Jul. 5, 1977. Application for reissue Aug. 30, 1978, Ser. No. 938,241

Int. Cl.⁴ E01F *9/00*

U.S. Cl. 404—10 **21 Claims**



27. An upright delineator of an impact-resistant, elongate web structure consisting of fiber-reinforced synthetic material for driving into hard ground, characterized in that said structure has concurrent driveability and flexibility characteristics wherein the product of EI (E=elastic modulus; I=moment of inertia) for the delineator is chosen such that it withstands buckling loads supplied at the delineator top during installation and that it establishes elastic character in an exposed section of said delineator to permit non-destructive deformation upon impact to permit passage of a moving vehicle over said delineator and subsequent immediate restoration to an original, upright condition, said elongate web structure comprising a combination of random or transversing and longitudinally oriented fibers embedded in 20 to 40 percent (w) resin binders, said fiber combination being comprised of at least 7 percent, but not more than 60 percent, fiber in random or transversing arrangement to increase tensile strength thereby to enable transverse flexibility, and said longitudinal orientation of fiber comprising the remaining percentage of total fiber content to provide longitudinal rigidity during said static conditions.

Re. 32,046
SOLUTIONS FOR STABILIZING THERMOPLASTIC POLYCARBONATES

Erich Eimers; Rolf Dhein, both of Krefeld; Wolfgang Cohnen, Leverkusen; Engelbert Kühle, and Gerhard Heywang, both of Bergisch Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Original No. 4,367,303, dated Jan. 4, 1983, Ser. No. 277,312, Jun. 25, 1981. Application for reissue Dec. 31, 1984, Ser. No. 687,787

Claims priority, application Fed. Rep. of Germany, Jul. 12, 1980, 3026503

Int. Cl.⁴ C08K *5/15, 5/50*

U.S. Cl. 524—107 **16 Claims**

1. A solution comprising at least one phosphine of the general formula

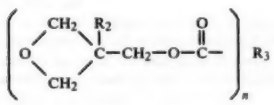
$$(R)_2P\text{-}R_1 \qquad \text{I}$$

wherein

R and R_1 independently denote an unsubstituted or substituted C_6 to C_{14} aryl radical and

R_1 may additionally denote an unsubstituted or substituted C_1 to C_{18} alkyl radical

in at least one oxetane compound of the general formula



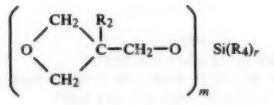
wherein

R_2 denotes a C_1 to C_{16} alkyl radical and

R_3 is either an n-valent radical of a C_2 to C_8 alkane, which may be substituted by at least one OH group and

n is 1, 2, 3, 4, 5, or 6 or

R_3 is a divalent radical of a cycloalkane and n is 2, or in at least one oxetane compound of the general formula



wherein

R_2 denotes a C_1 to C_{16} alkyl radical,

R_4 denotes a C_1 to C_4 alkyl radical which may be substituted by cyano, carboxyl or acetoxy, an allyl radical, a C_6 to C_{14} aryl radical which may be substituted by alkyl, or a C_7 to C_{14} aralkyl or C_1 to C_4 alkoxy radical which may be substituted by C_1 to C_4 alkoxy or allyloxy,

m is 1, 2, 3, or 4 and

r is 0, 1, 2 or 3 with the proviso that m+r equal 4,

in which the mixing ratio of dissolved phosphine of the formula I to solvent, containing oxetane groups, of the formula II or III is between 3 and 10 oxetane group equivalents of the solvent containing oxetane groups per atom equivalent of phosphorus of the phosphine.

PLANT PATENTS

GRANTED DECEMBER 10, 1985

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,590

MINIATURE ROSE PLANTS

Cecilia L. D. Bennett, 489 Minot Ave., Chula Vista, Calif. 92010

Filed Aug. 1, 1983, Ser. No. 200,200

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—7 **1 Claim**

1. A new and distinct variety of miniature rose plant, substantially as shown and described, characterized by buds and blossoms of a soft shell pink color, with varying amounts of apricot, similar to Elizabeth of Glamis, being borne singly on long, slender, thornless stems, the plant being dwarf, hardy, rounded, much branched, well foliaged, vigorous, and easily propagated from buds or cuttings.

5,591

NECTARINE TREE, "RED LION"

Lionel M. Serimian, 11310 E. Manning Ave., and Donald M. Serimian, 2961 McCall Ave., both of Selma, Calif. 93662

Filed Feb. 10, 1984, Ser. No. 578,951

Int. Cl.[4] A01H *5/03*

U.S. Cl. Plt.—41 **1 Claim**

1. A new and distinct variety of nectarine tree substantially as illustrated and described, bearing fruit which mature approximately with that of the Red Jim (U.S. Plant Pat. No. 4,518) which it most nearly resembles, in its regular and productive bearing of medium-sized, clingstone fruit, but from which it is distinguished as to novelty by its fruit having a more spherical shape with a shallow, virtually inconspicuous suture coloring substantially simultaneously and evenly with the skin of the fruit as the fruit matures and by its leaves whose upper surfaces have a more vivid and darker green color.

5,592

IMPATIENS PLANT NAMED VISTA IMPATIENS NO. 13

Claude Hope, Cartago, Costa Rica, assignor to Pan American Plant Company, Parrish, Fla.

Filed Dec. 29, 1983, Ser. No. 566,802

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of impatiens plant named Vista Impatiens No. 13, as described and illustrated, and characterized by its very large vivid orange-red flowers, dark green attractive foliage, good keeping qualities, and by its compact and dense self-branching habit, making the new cultivar ideal for bedding plants, pot plant culture and hanging baskets.

5,593

IMPATIENS PLANT NAMED VISTA IMPATIENS NO. 3

Claude Hope, Cartago, Costa Rica, assignor to Pan American Plant Company, Parrish, Fla.

Filed Dec. 29, 1983, Ser. No. 566,803

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of impatiens plant known as Vista Impatiens No. 3, as described and illustrated, and particularly characterized by its compact, spreading and self-branching habit; large and brilliant carmine flowers; dark red-green foliage, and suitability for growing as a bedding plant, pot plant or hanging basket.

5,594

IMPATIENS PLANT NAMED VISTA IMPATIENS NO. 10

Claude Hope, Cartago, Costa Rica, assignor to Pan American Plant Company, Parrish, Fla.

Filed Dec. 29, 1983, Ser. No. 566,805

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of impatiens plant named Vista Impatiens No. 10, as described and illustrated, and characterized by its vivid red and large flowers, dark green foliage, profuse blooming, and tall and upright habit, making it suitable for bedding plants and pot plant culture.

5,595

AFRICAN VIOLET (LYNN)

Elichi Yoshida, P.O. Box 4836, Hayward, Calif. 94540

Filed Feb. 10, 1984, Ser. No. 579,176

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—69 **1 Claim**

1. An African Violet plant substantially as shown and described.

5,596

AFRICAN VIOLET (SARA)

Elichi Yoshida, P.O. Box 4836, Hayward, Calif. 94540

Filed Feb. 10, 1984, Ser. No. 579,177

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—69 **1 Claim**

1. A novel African Violet plant substantially as shown and described.

5,597

AFRICAN VIOLET (RHONDA)

Elichi Yoshida, P.O. Box 4836, Hayward, Calif. 94540

Filed Feb. 10, 1984, Ser. No. 579,179

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—69 **1 Claim**

1. An African Violet plant substantially as shown and described.

PATENTS

GRANTED DEC. 10, 1985

ERRATA

For CLASS	See PATENT NO.
623–002	4,556,996
623–003	4,556,997
623–006	4,556,998
353–081	4,557,055
414–330	4,557,698
208–108	4,557,803
556–183	4,557,871
514–344	4,558,134

PATENTS

GRANTED DECEMBER 10, 1985

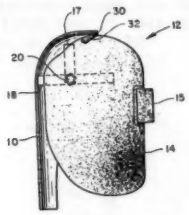
GENERAL AND MECHANICAL

4,556,991

PROTECTING VEIL FOR WELDING HELMETS

Mihail A. Margaronis, 167 Parkview Ave., Bangor, Mass. 04401, and Richard L. Manzo, 54 Prospect St., Millinocket, Me. 04462

Filed Sep. 7, 1984, Ser. No. 648,072
Int. Cl.[4] A42B *3/00*
U.S. Cl. 2—8 **7 Claims**



1. Apparatus for protecting a welder in association with a welding helmet of the type which is open at the top and back of the helmet with a defined helmet edge contour across the top of the helmet, said helmet supported by head gear for seating over the head of the welder and for raising and lowering the helmet, comprising:

elongate flexible fabric veil means comprising fire resistant fabric material, said veil means having a width across the top sufficient to match the width of the welding helmet, and a veil top contour similar to the helmet edge contour across the top of the helmet:

said veil means formed with shoulder length for extending from the helmet edge contour across the top of the helmet over the back of the helmet and below the bottom of the helmet a sufficient distance so that the bottom of the veil means lies on the back of the shoulders of a welder wearing the welding helmet;

said veil means constructed and tapered with increasing width in the elongate direction along the sides of the veil from the veil top edge to the bottom of the veil means, said veil means having a veil bottom edge substantially wider than the helmet for spreading out on either side behind the helmet across the back of the shoulders of a welder wearing the helmet thereby deflecting arc rays, light rays, and welding spatter coming from behind the welder and shielding the welder from entry of rays or spatter into the helmet from behind:

said veil means formed with an engaging coupling surface across the veil top edge:

complementary helmet coupling surface means constructed and arranged to be secured adjacent to the helmet edge contour on the outside surface of the helmet across the top of the helmet for removably and replaceably securing the engaging coupling surface of the veil top edge to the helmet along the complementary helmet coupling surface means at the helmet edge contour on the outside surface of the top of the helmet, said veil means being secured to the top of the helmet without being secured at the sides of the veil means to the helmet:

said veil means thereby providing elongate side openings oriented in the forward direction between the helmet and the veil means on a welder wearing the helmet, for free movement of the veil means relative to the back of the shoulders of a welder during movement of the welder's head and during raising and lowering of the helmet, while protecting the back of the head, neck and collar of the welder and shielding and deflecting rays and spatter from behind, said veil means at the same time permitting free air movement and movement of sound waves through the helmet at the side openings between the helmet and veil;

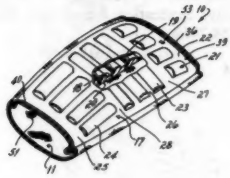
said veil means being readily removable and replaceable with respect to the welding helmet and foldable and portable so that a welder can conveniently carry the veil in folded condition for ready use according to the environmental conditions at the work place.

4,556,992

PROTECTIVE HAND PAD, AND METHOD OF MAKING SAME

Alvin C. Drury, Cincinnati, Ohio, assignor to Jung Corporation, Cincinnati, Ohio

Filed May 16, 1983, Ser. No. 494,821
Int. Cl.[4] A41D *13/08*
U.S. Cl. 2—20 **7 Claims**



1. A method of fabricating a protective pad, said method comprising the steps of

cutting a predetermined length elastic sleeve from an endless length of an elastic woven fabric tube as a first component,

providing a preformed pad element as a second component,

inserting said preformed pad element into said elastic sleeve,

stitching the opposed end edges of said pad element to said elastic sleeve, and stitching the opposed side edges of said pad element to said elastic sleeve, so that said pad element and said sleeve together define an intermediate product having a generally tubular configuration open at both ends, and

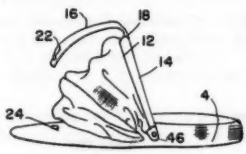
thereafter turning said intermediate product inside out to provide a finished protective pad product.

4,556,993

CONVERTIBLE SUNVISOR CAP

Edward T. Okamura, Sr., 2209 Young St., Honolulu, Hi. 96826

Filed May 22, 1984, Ser. No. 612,884
Int. Cl.[4] A42B *1/24*
U.S. Cl. 2—196 **13 Claims**



9. Convertible sunvisor cap apparatus comprising band means for surrounding a head of a wearer and visor means connected to the band means for extending forward from the band means over the eyes of a wearer, a soft flexible crown means for selectively covering the head of the wearer, the crown means having a forward lower edge, means for connecting the forward lower edge of the crown means adjacent a rearward portion of the visor, the crown means having a rear-

ward lower edge portion, means for permitting the rearward lower edge portion of the crown to be adjacent a rearward portion of the band in cap configuration and means for securing the rearward lower edge portion of the crown in a forward position when the crown is folded in a sunvisor form.

4,556,994

FULL FACE-TYPE HELMET

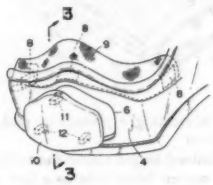
Kazuhiro Kawasaki, and Akio Muranaka, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 17, 1984, Ser. No. 571,504

Claims priority, application Japan, Jan. 20, 1983, 58-6587; Jan. 20, 1983, 58-7834

Int. Cl.⁴ A61F *9/04*

U.S. Cl. 2—424 **9 Claims**



1. A full-face type helmet having a shell which opens downwardly, a viewing window in the front portion of said shell, and a light-permeable face shield detachably mounted on said shell for covering said window, the improvement comprising:

a mouth opening defined in said shell below said window;

a mouth cap detachably mounted on said shell for covering said mouth opening;

a nose cover detachably mounted in said shell for intimate contact with a face portion of a wearer between the eyes and nostrils to define an upper space in said helmet; and

said nose cover being mounted to said shell between said viewing window and said mouth opening.

4,556,995

GOGGLES FOR SPORTS

Tamenobu Yamamoto, Osaka, Japan, assignor to Yamamoto Kagaku Co., Ltd., Osaka, Japan

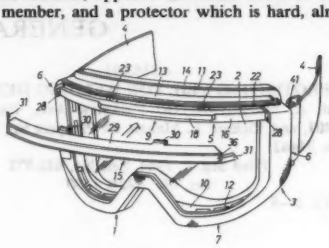
Filed Jan. 11, 1984, Ser. No. 569,805

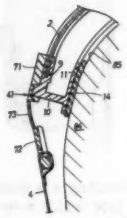
Claims priority, application Japan, Jan. 11, 1983, 58-2460[U]; Jan. 11, 1983, 58-2461[U]; Oct. 11, 1983, 58-157794[U]

Int. Cl.⁴ A61F *9/02*

U.S. Cl. 2—439 **8 Claims**

1. Goggles for sports comprising a lens, a soft deformable frame surrounding the lens for holding the lens and including an upper frame member, opposite side frame members and a lower frame member, and a protector which is hard, almost





undeformable and separate from the frame provided along the front portion of at least the upper frame member of the frame.

4,556,996

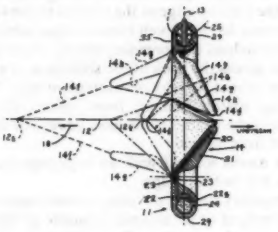
HEART VALVE

Robert S. Wallace, 823 S. Longwood Ave., Los Angeles, Calif. 90005, assignor to Robert S. Wallace, Los Angeles and Jack Bauman, Pacific Palisades, both of, Calif., a part interest

Filed Aug. 4, 1983, Ser. No. 520,499

Int. Cl.⁴ A61F *1/22*

U.S. Cl. 623—2 **6 Claims**



1. An artificial heart valve comprising:

(a) a circular annular support having a central axis, said annular support having an imaginary bisecting plane of symmetry perpendicular to said axis,

(b) multiple triangular valve flaps integrally molded with said flaps and support,

(c) hinges having a thickness less than that of either the flaps or annular support and joining the flaps to the annular support on a first side of said symmetry plane,

(d) each of said flaps having an unbiased as molded position in which each of said triangular flaps taper substantially to a point on said axis which is on a second side of said symmetry plane, each of said flaps further including a plastic core of resiliently bendable molded material which acts to urge the flaps toward their as molded position,

(e) said valve in use being repositioned by inverting said flaps through said plane of symmetry so that they are biased to a first closed position, said flaps further being capable of opening to a second position when the pressure across the valve is sufficient to overcome the biasing of said flaps.

4,556,997

APPARATUS FOR DRIVING MEDICAL APPLIANCES

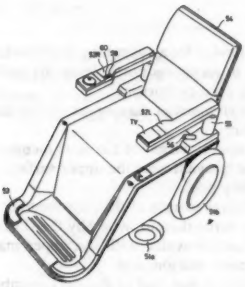
Sanshiro Takamiya, Nagoya; Michisuke Yoshizawa, Tokyo, and Akira Suzuki, Nishio, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Mar. 29, 1984, Ser. No. 594,639

Claims priority, application Japan, Mar. 29, 1983, 58-52853; Mar. 29, 1983, 58-52854; Mar. 29, 1983, 58-52855; Mar. 29, 1983, 58-52856; Mar. 29, 1983, 58-52857

Int. Cl.⁴ A61F *1/24*

U.S. Cl. 623—3 **21 Claims**



1. A mobile apparatus for transporting a patient connected to a medical appliance comprising:

a wheelchair;

medical appliance driving means mounted on said wheelchair and comprising; a positive pressure source; a first solenoid valve having an input terminal connected to an output terminal of said positive pressure source; first pressure detecting means for detecting the pressure at an output terminal of said first solenoid valve; a second solenoid valve having an input terminal connected to the output terminal of said first solenoid valve and an output terminal adapted to be connected to said medical appliance; a negative pressure source; a third solenoid valve having an input terminal connected to said negative pressure source; second pressure detecting means for detecting the pressure at an output terminal of said third solenoid valve; a fourth solenoid valve having an input terminal connected to the output terminal of said third solenoid valve and an output terminal adapted to be connected to said medical appliance; and first electronic control means adapted to control opening and closing of said first solenoid valve in response to an output signal from said first pressure detecting means, control opening and closing of said third solenoid valve in response to an output signal from said second pressure detecting means, and to control opening and closing of said second and fourth solenoid valves at predetermined timings, respectively;

electric motor means for driving said wheelchair;

instruction means for controlling energization of said electric motor means;

state detecting means for detecting at least one state of at least one part moveable on said wheel chair, the state of a moveable part of said medical appliance driving means and the state of said instruction means and providing signals indicative of said states; and

second electronic control means connected to said state detecting means for energizing said electric motor means in response to operation of said instruction means, and for inhibiting energization of said electric motor means when said state detecting means detects a dangerous state.

4,556,998

ARTIFICIAL INTRAOCULAR LENSES AND METHOD FOR THEIR SURGICAL IMPLANTATION

Steven B. Siepser, 119 Devon Rd., Paoli, Pa. 19301

Filed Aug. 4, 1983, Ser. No. 520,187

Int. Cl.⁴ A61F *1/16*

U.S. Cl. 623—6 **14 Claims**

1. In an artificial intraocular lens for surgical implantation to replace a damaged natural lens in an otherwise functional eye of a patient, the improvement which comprises:

said artificial lens having a cross sectional dimension substantially less than that of the natural lens, and

being composed of a dry, solid hydrophilic material capable of hydration by the natural fluid present in the eye to expand after implantation to provide an optically correct lens;

to thus improve the vision of the patient.

4,556,999

APPARATUS FOR REMOVING NOXIOUS FUMES AND GASES FROM A COMMODE BOWL AND PREVENTING THEIR ESCAPE TO THE IMMEDIATE VICINITY

John E. Lindley, 1410 20th Ave., Meridian, Miss. 39301

Filed Nov. 15, 1984, Ser. No. 671,787

Int. Cl.⁴ E03D *9/05, 9/052;* A47K *13/00*

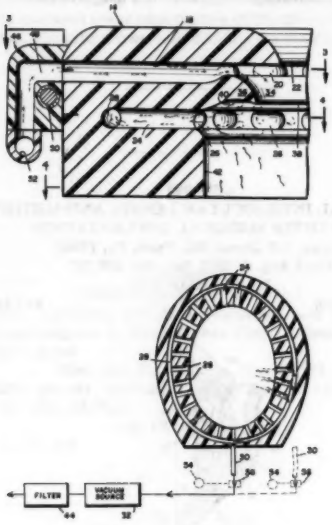
U.S. Cl. 4—217 **16 Claims**

1. Apparatus for removing and containing noxious fumes in a commode bowl having a generally annular seat portion comprising:

air inlet passage means operatively associated with said bowl for passage of ambient air thereinto, said inlet passage means having air inlet means outside said bowl and having air outlet means facing inward about and adjacent the inner periphery of said bowl adjacent the upper portion thereof; and

gas outlet passage means operatively associated with said bowl and having gas inlet means about and adjacent the inner periphery of said bowl below said air outlet means

and having gas outlet means outside said bowl adapted to be connected to a source of negative pressure for with-



drawing the incoming air and gases mixed therewith from within said bowl for discharge outside thereof.

4,557,000

TOILET-TANK DISCHARGE VALVE

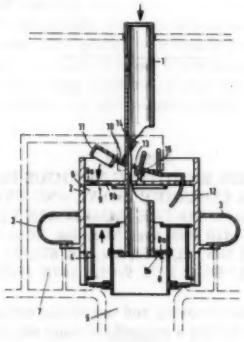
Reiner Strangfeld, Bückeburg, Fed. Rep. of Germany, assignor to Georg Rost and Sohne Armaturenfabrik GmbH & Co. KG, both of Porta Westfalica Lerbeck, Fed. Rep. of Germany

Filed Sep. 13, 1983, Ser. No. 531,783

Claims priority, application European Pat. Off., Sep. 15, 1982, 82108501.6

Int. Cl.⁴ E03D *1/14, 1/34*

U.S. Cl. 4—324 **15 Claims**



1. In a toilet-tank discharge valve having a main-valve body that is liftable off of its seat as a result of negative water balance in an associated discharge compartment effected, in response to the release-activating of an auxiliary valve by an activating mechanism, the improvement comprising: a supplementary auxiliary valve associated with the discharge compartment and responsive to a discontinuance activation of the activating mechanism to open at least briefly to produce a positive water balance in the discharge compartment until the main-valve body closes.

4,557,001

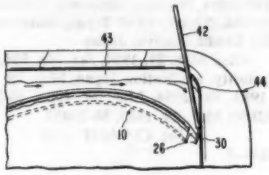
SKIMMING DEVICE FOR SWIMMING POOL

Scott C. Burkhart, 1155 Innsbruck St., Livermore, Calif. 94550

Filed Dec. 1, 1983, Ser. No. 557,028

Int. Cl.⁴ E04H *3/20*

U.S. Cl. 4—490 **9 Claims**



1. A skimmer device for a swimming pool having a side wall opening leading to an access porthole on the surface adjacent to the swimming pool comprising:

a perforate skirt member having an upper margin and a lower margin;

means on the upper margin of the skirt member for rendering the same buoyant near the upper surface of the water in a swimming pool;

means on the lower margin of the skirt member for applying a downward force thereto, whereby the skirt member will be oriented in the water with the upper margin thereof above the lower margin; and

a handle coupled to one end of the skirt member for manually moving said one end of the skirt relative to the other end along the side wall of the swimming pool as the other end of the skirt is substantially in a fixed position near said side wall opening to thereby cause the skirt member to be moved in a manner to form a loop to trap debris, said skirt member, said rendering means and said force applying means being sufficiently flexible to allow the ends of the skirt member to be inserted into the side wall opening and through and out of said access porthole so that the skirt member may be pulled out of the swimming pool, through the side wall opening and through and out of the access porthole to decrease the size of said loop, whereby debris on the surface of the water may be removed from the water by removal of the skirt in the form of said loop from the water.

4,557,002

BATHTUB ELEVATOR

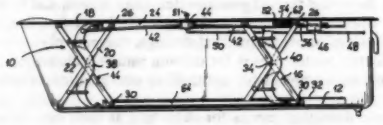
Peter Schmidt, Wittumweg 38, D-7989 Eisenharz, Fed. Rep. of Germany

Filed Jun. 18, 1984, Ser. No. 621,785

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1983, 3324294

Int. Cl.⁴ A47K *3/12*

U.S. Cl. 4—564 **7 Claims**



1. An elevator for disabled persons, comprising a floor frame, at least one guiding linkage attached to the floor frame, a lifting plate supported by said guiding linkage, a lifting apparatus, which is disposed between said lifting plate and the floor

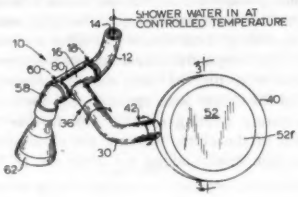
frame and adapted to be operated with water under pressure, and a manually operable control valve for filling and draining the lifting apparatus, wherein the guiding linkage comprise two juxtaposed, spaced apart pairs of tong levers, the ton levers of each pair are pivotally interconnected at their center, and each of said tong levers is provided at one end with a fixed swivel bearing, which is connected to the floor frame or to the lifting plate, and at the other end with a slide bearing, which is slidable along a rail, a shutoff valve preceding the manually operable control valve in the flow path of the water under pressure flowing to the lifting apparatus and comprising a valve control member engaged by an actuating member, displacing the valve control member into a position for closing the shutoff valve when the lifting plate has been raised to a predetermined elevation, the actuating member provided with an arm extending into the path of a spacer, sliding in unison with the slide bearing of at least one tong lever during the closing stroke of the valve control member, and said arm constituting a mechanical stop for said spacer when the shutoff valve is in its closed position.

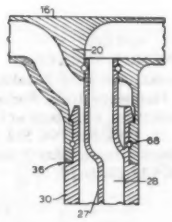
4,557,003

SHOWER MIRROR APPARATUS

Thomas L. Jones, 11 Yorkshire St., Asheville, N.C. 28803

Filed Apr. 22, 1985, Ser. No. 725,829
Int. Cl.[4] A47K *3/22*
U.S. Cl. 4—605 **4 Claims**





1. In a shower apparatus having a water supply for dispensing shower water through a shower head, the improvement comprising:

(a) a first tubular connector having a fixed connection to a shower water supply;

(b) a second tubular connector mounting on one end of a shower head;

(c) a tee fitting including:

(i) an inlet connected to said shower water supply through said first tubular connector;

(ii) an outlet connected to said shower head through said second tubular connector; and

(iii) an internal divider establishing a first passage communicating with said inlet and a second passage communicating with said outlet;

(d) a mirror assembly having:

(i) a housing having a back wall and a front wall;

(ii) a mirror mounted in said housing adjacent said front wall and having a front reflective surface and a back surface; and

(iii) a plenum formed by said front wall with said back wall for holding shower water to be placed in contact with said front wall which is in contact with said mirror back surface so as to transmit heat from said front wall to said mirror back and to heat said mirror front surface to prevent fogging thereof;

(e) a third tubular connector having:

(i) a first passage communicating said tee fitting first passage with said plenum for transferring shower water from said supply to said plenum to fill said plenum and through heat transfer heat said mirror; and

(ii) a second passage communicating said tee fitting second passage with said plenum for transferring shower water which has heated said mirror back surface through heat transfer from said plenum to said shower head;

(f) rotatable coupling means joining said tee connector to said first, second and third tubular connectors and said third tubular connector to said housing whereby:

(i) said tee connector is enabled to rotate relative to said first and second tubular connectors;

(ii) said third tubular connector is enabled to rotate relative to said tee connector; and

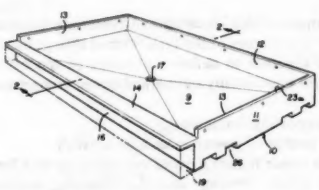
(iii) said mirror housing is enabled to rotate relative to said third tubular connector.

4,557,004

WATERPROOF SHOWER MODULE WITH TILE-READY INNER SURFACES

Angelo J. Piana, 8542 NW. 25th Pl., Coral Springs, Fla. 33065

Filed Jun. 28, 1984, Ser. No. 625,638
Int. Cl.[4] A47K *3/22*
U.S. Cl. 4—613 **2 Claims**



1. For use in a building structure having:

a horizontal sub-floor;

spaced vertical studs extending up from said sub-floor and presenting inner sides to form the boundary of a shower enclosure;

vertical wallboard panels attached to the inner sides of said studs and bridging the spaces between said studs to provide the walls of the shower enclosure;

and wire lath covering said panels at the inside for the attachment of tile;

said panels having respective horizontal bottom edges spaced a predetermined distance above the sub-floor and each having a predetermined combined thickness with the wire lath along said bottom edge;

the improvement which comprises:

a one-piece shower module shaped and dimensioned to fit snugly between the sub-floor and said bottom edges of said wallboard panels;

said shower module having a floor segment for overlying engagement with the sub-floor in the area of the latter bounded by said vertical studs, said floor segment having a drain opening and a top surface sloping down to said drain opening on all sides of said opening;

and said shower module at the periphery of said floor segment having side segments extending up from said floor segment and positioned to abut against said inner sides of the studs, said side segments terminating in horizontal top

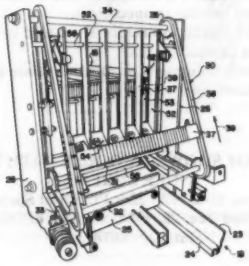
edges positioned to closely underlie said bottom edges of the wallboard panels, said side segments at said top edges having a thickness equal to the combined thickness of the corresponding wallboard panels and wire lath at said bottom edges of said panels, whereby to enable tile to extend continuously across the inside of said wallboard panels and said side segments of the shower module.

4,557,005

LEAF CUTTER BEE LARVAE EXTRACTING DEVICE

William Rossmo, 158 Mount Allison Crescent, Saskatoon, Saskatchewan, Canada S7H 4A5

Filed Aug. 2, 1984, Ser. No. 636,870
Int. Cl.[4] A01K *51/00*
U.S. Cl. 6—12 R **14 Claims**



1. Apparatus for cleaning and removing cocoons from the slots of hive frames of the type formed by a plurality of boards stacked together to define a plurality of spaced and parallel elongated substantially cylindrical bores; comprising in combination

(a) supporting framework,

(b) a source of power in said framework,

(c) an upper input raceway supported in said framework,

(d) a board shearing and slot cleaning assembly in said framework at the inner end of said upper raceway,

(e) means in said assembly adjacent the inner ends of said upper raceway for supporting the underside of the board immediately adjacent the innermost board of said hive section on said upper raceway,

(f) means in said assembly for engaging the upper side of the innermost board of said hive section, separating same from said hive section in shearing motion and moving said innermost board downwardly,

(g) guides in said assembly pivotally mounted by the upper ends therefor, for guiding said innermost board downwardly,

(h) a front comb mounted on the lower ends of said guide means and extending across said assembly, and being movable with said guides whereby said comb aligns with the contour of said board, a mating further comb assembly mounted in said framework and extending across said framework, said innermost board being engaged by said comb assemblies one on each side thereof, whereby cocoons in said slots are retained as said board moves past said comb assemblies, said comb assemblies inclining upwardly and inwardly towards one another and having board surface engaging edges,

(i) means to remove said cocoons from adjacent said comb assemblies,

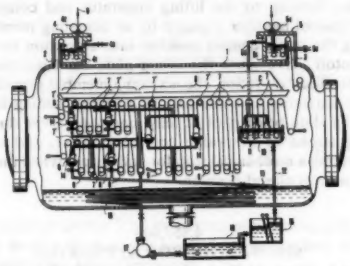
(j) means to move said board from below said comb assemblies to said lower raceway.

4,557,006

METHOD FOR SETTING AND PRETREATING A CLOTH

Yoshikazu Sando, and Hiroshi Ishidoshiro, both of Wakayama, Japan, assignors to Sando Iron Works Co., Ltd., Wakayama, Japan

Filed Sep. 14, 1984, Ser. No. 651,117
Claims priority, application Japan, Sep. 16, 1983, 58-170685
Int. Cl.[4] D06B *3/12*
U.S. Cl. 8—149.1 **4 Claims**



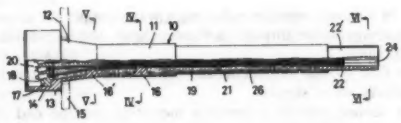
1. A method for setting and pretreating a cloth by a continuous process which comprises supplying a long cloth soaked with a treating solution continuously into a steamer body by piling up several sheets one on top of the other, steaming each cloth by separating these sheets just after the supply while applying a high temperature treating solution thereto, widening the sheets for setting the cloth, and then steaming the cloth by piling up the sheets once again during application of the high temperature treating solution still further thereto for pretreatment of the cloth, washing the cloth with washing water, and then finally taking the cloth out of the steamer body.

4,557,007

ANCHOR SOCKET

Hisashi Daiguji, Toyonaka, and Ikuo Tanaka, Itami, both of Japan, assignors to Harumoto Iron Works Co., Ltd. and Sumitomo Electric Industries, Ltd., both of Osaka, Japan

Filed Feb. 29, 1984, Ser. No. 584,785
Claims priority, application Japan, May 9, 1983, 58-70249[U]
Int. Cl.[4] E01D *19/10*
U.S. Cl. 14—22 **6 Claims**

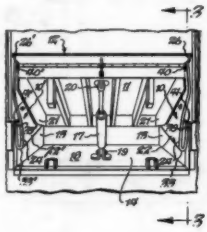


1. An anchor socket for bridge cables having bundles of stranded steel wires, means for fastening said cables longitudinally to said anchor socket in spaced relationship, said anchor socket having a first series of ribs formed on the inner wall thereof and a second series of ribs spaced a greater longitudinal distance from said fastening means than said first series of ribs, said first series of ribs having a larger inner diameter than said second series of ribs, said ribs being adapted to engage the radial outermost of said wires for effecting a curvature thereof with said wires being free of engagement with said ribs in the longitudinal area between said ribs.

4,557,008
DOCK LEVELER SEAL CONSTRUCTION

Jerry E. Jurden, Lawrenceville, Ga., assignor to Flexion, Inc., Pittsburgh, Pa.

Filed Sep. 9, 1983, Ser. No. 531,170
Int. Cl.[4] E01D 1/00
U.S. Cl. 14—71.7 20 Claims

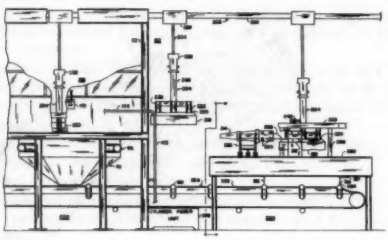


1. In a dock leveler having a platform with first opposite sides which move vertically relative to second opposite sides of a pit adjacent said first opposite sides of said platform, a seal construction comprising a pair of curtain members each having first and second edges, first means for securing one of each of said first edges to one of each of said first opposite sides of said platform, second means for securing one of each of said second edges to one of each of said second opposite sides of said pit, said curtain members having a sufficient expanse between said first and second edges so that they block the openings between said first sides of said platform and said second sides of said pit in all positions of said platform.

4,557,009
CARBON ELECTRODE CLEANING SYSTEM

Raymond J. Dill, 1910 Erskine Dr., Florence, Ala. 35630

Continuation-in-part of Ser. No. 510,659, Jul. 5, 1983, Pat. No. 4,472,852. This application Sep. 21, 1984, Ser. No. 653,689
Int. Cl.[4] B08B 1/00
U.S. Cl. 15—4 16 Claims



1. A carbon electrode cleaning system comprising:

first and second banks of flailing assemblies comprising:

a first plurality of horizontally spaced vertical shafts, and a second plurality of horizontally spaced vertical shafts, said first shafts being horizontally spaced from said second shafts,

first motive means for rotating said first shafts in a first direction, and second motive means for rotating said second shafts in a second and opposite direction,

a first plurality of flailing elements attached to said first shafts and extending horizontally when said first shafts are rotated, and

a second plurality of flailing elements attached to said second shafts and extending horizontally when said second shafts are rotated;

a hopper having walls to the side of said flailing assemblies and having a bottom opening;

suspension means for vertically suspending a carbon electrode;

horizontal positioning means for horizontally and relatively positioning said shafts of said flailing assemblies and said carbon electrode;

vertical positioning means for vertically and relatively positioning said flailing elements and said carbon electrode; and

said suspension means includes means for horizontally moving a said carbon electrode along a path including, in order, a first station and second station, and wherein said banks of said flailing assemblies are generally located at said second station, and said cleaning system further comprising an electrode scraping system located at said first station, and said scraping system comprising:

a support stand,

scraping means supported by said support stand for applying a scraping force to a said carbon electrode,

guide means for relatively positioning said support stand and a said electrode,

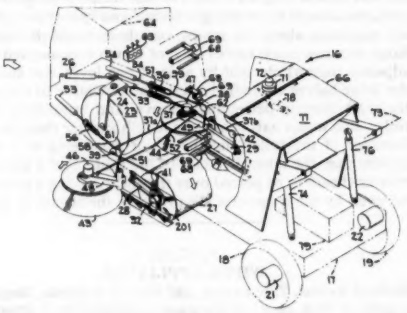
confining means for selectively confining the movement of a said electrode while said scraping means is operated across a surface of said electrode, and

said suspension means includes a hoist supporting said electrode, an overhead conveyor supporting said hoist, and said overhead conveyor being positioned to extend through said first and second stations.

4,557,010
DEBRIS COLLECTION SYSTEM FOR STREET SWEEPERS

Richard B. Rosseau, Claremont, Calif., assignor to FMC Corporation, Chicago, Ill.

Filed Sep. 30, 1982, Ser. No. 431,959
Int. Cl.[4] E01H 1/04
U.S. Cl. 15—83 18 Claims



1. In a street sweeping machine having a framework, a floating support apparatus for a driven sweeping brush adapted for contact with an underlying surface to be swept, comprising

means for suspending the driven sweeping brush from the machine framework and for allowing up and down movement of the sweeping brush relative to the framework,

power means fixed to the framework,

an adustable member extending from and being movable by said power means for infinite positioning within a range between fully extended and fully retracted positions relative to said power means,

a spring assembly coupled at one end to said adjustable member,

means for coupling the other end of said spring assembly to said means for suspending, and

means for controlling said power means so that said means

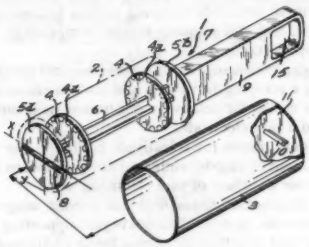
for suspending may be controlled between a raised carrying position and various lowered brushing positions, whereby brush pressure on the underlying surface to be swept is adjustable.

4,557,011

FIXTURE TO SUPPORT ADHESIVE PAPER ROLLERS ON ROLLER BRUSHES FOR DUSTING CLOTHING ARTICLES

Francesco Sartori, Via S. Felice 44, Bologna, Italy

Filed May 25, 1983, Ser. No. 497,860
Claims priority, application Italy, May 25, 1982, 4921/82[U]
Int. Cl.⁴ A47L *25/00*
U.S. Cl. 15—104 A **6 Claims**



1. A fixture for supporting adhesive coated rollers used to remove lint from clothing comprising a shaft, at least one pair of disc-shaped support elements for the roller integral with said shaft and having a width less than the inner diameter of the roller and positioned apart from one another distance less than the length of the roller and allowing rotational movement thereon, a set of disc-shaped ledges positioned axially outside the support elements, the ledges having a dimension, radial with respect to the axis of the shaft, which is greater than the inner diameter and less than the other diameter of the roller, the first of said ledges having a handle member integral therewith, the second ledge being elliptical and having a transverse slit extending along the minor axis thereof and dividing the ledge into two equal halves each of which is connected to the adjacent support element by at least one lever arm such that the ledge halves are radially deflectable relative to the axis of the shaft thereby permitting removal and installation of the roller, said minor axis being of a length smaller than the inner diameter of the roller and the major axis being of a length greater than the inner diameter of the roller, and a protective tubular sheath to be placed over the roller having a projection received by the transverse slit to secure the sheath in place.

4,557,012

WIPER APPLIANCE

Michael Knebel, Zehnhausen, and Rolf G. Schülein, Singhofen, both of Fed. Rep. of Germany, assignors to Leifheit AG, Nassau, Fed. Rep. of Germany

Filed May 30, 1984, Ser. No. 615,510
Claims priority, application European Pat. Off., May 30, 1983, 83105319.4; Mar. 27, 1984, 84103346.7
Int. Cl.⁴ A47L *13/146*
U.S. Cl. 15—116 R **25 Claims**

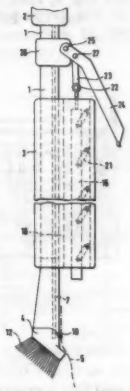
1. A wiper appliance comprising:

a shaft;

wiping means positioned at one end of the shaft;

a pressure device positioned on the shaft for removing liquid from said wiping means, said pressure device including a chamber, a pressure plate movably positioned in said chamber, a counter pressure plate, and means for moving said pressure plate into and out of engagement with said counter pressure plate; and

traction means for conveying a portion of said wiping means into and out of said chamber of said pressure device and being movable along said shaft, said traction means conveying said wiping means to a position between said pressure plate and said counter pressure plate in said chamber,



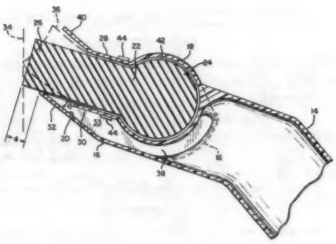
whereby said pressure plate is movable into engagement with said counter pressure plate with said wiping means therebetween to press said wiping means to remove liquid therefrom.

4,557,013

VACUUM COUPLED SQUEEGEE ATTACHMENT

Lee Belmont, P.O. Box 171, West Linn, Oreg. 97068

Filed Jun. 18, 1984, Ser. No. 621,622
Int. Cl.⁴ A47L *9/06*
U.S. Cl. 15—401 **9 Claims**



1. A Vacuum coupled squeegee for the removal of dirt and foreign matter from a planar surface comprising:

(a) vacuum-producing means for creating suction in a conduit;

(b) an elongate cleaning attachment for said conduit having:

(i) a rear aperture connected to said conduit,

(ii) a front suction port extending substantially the length of said attachment,

(iii) a holder for a deformable blade disposed adjacent said port; and

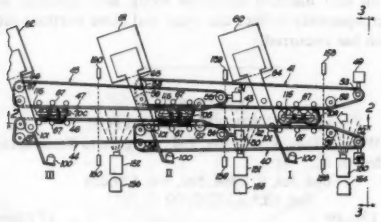
(c) a deformable blade insertable into said holder covering said port and extending slightly forwardly of said port, such that when said blade is drawn across said planar surface, said blade deforms, opening said port so as to create a region of suction in the area bounded by said blade, said surface and said port.

4,557,014

METHOD AND APPARATUS FOR PROCESSING SIMILAR WORKPIECES OF VARYING SHAPE, POINTS OF CONTOUR AND DIMENSION

Norman H. Vogt, Lewiston, Mich., assignor to William T. Sevald, Bellaire, Mich.

Continuation-in-part of Ser. No. 373,441, Jul. 30, 1982. This application Nov. 29, 1983, Ser. No. 556,146
Int. Cl.[4] A22C *17/00*
U.S. Cl. 17—1 R 8 Claims



1. Apparatus for processing animal carcasses which differ in length and vary as to height of feature at which a tool should do desired work with the carcasses hanging lengthwise vertically, comprising,

an overhead rail,

trolleys on said rail including means for hanging carcasses lengthwise vertically downwardly,

a tool downstream under said rail for intercepting and performing work at a selected common feature of said carcasses,

means driving said trolleys along said rail to carry carcasses past said tool,

means for adjusting the vertical height of said tool to work on different carcasses with the same selected common feature lying at different vertical elevations, and

control means for selectively activating said adjusting means to bring said tool to the height of the feature prior to each carcass moving past said tool whereby said tool does work on each carcass at the desired feature,

at least one pair of opposed endless belts below said rail to steady the carcasses including,

a first endless belt below said rail disposed on edge with a flat side vertical for bearing against a portion of the backs of carcasses,

a second endless belt below said rail paired with said first belt disposed on edge with a flat side vertical for bearing against a portion of the fronts of carcasses in opposition to said first belt,

said belts thereby holding carcasses between said belts steady as they move past said tool,

rollers supporting said belts,

at least one said roller imparting drive to said first belt,

at least one said roller imparting drive to said second belt, and

means rotating said drive rollers to move said belts at the same speed as said trolleys on said rail.

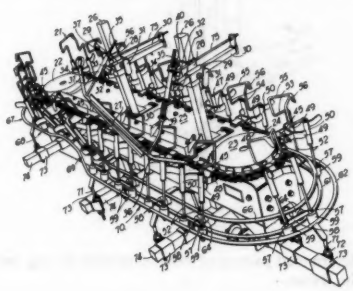
4,557,015

POULTRY HALVING MACHINE

Thurston Dodd, Rte. 2, Lula, Ga. 30554

Filed Oct. 6, 1983, Ser. No. 539,705
Int. Cl.[4] A22C *21/00*
U.S. Cl. 17—11 6 Claims

1. A machine for severing birds across the backbone between the breast and hind quarters comprising an overhead shackle line by means of which birds in succession hanging by their hocks are conveyed substantially horizontally through a severing zone, an endless substantially horizontal conveyor for bird orientation and positioning device below said overhead shackle line and moving in timed relation to the shackle line through said severing zone, plural spaced bird orientation and positioning devices attached to and traveling with said endless conveyor and each having a pivotal connection with the endless conveyor for swinging movement in a vertical plane relative to the endless conveyor, three endless cam tracks disposed below the endless conveyor and extending in generally parallel relationship to the endless conveyor, each bird orientation and positioning device including a reciprocatory member terminating at its top in a bird body cavity engaging and stretching element, three follower elements on the lower end portion of said reciprocatory member and engaging the three cam tracks in such a manner that during passage of each bird and each bird



orientation and positioning device through the severing zone the engaging and stretching element swings to a position over the bird cavity, descends into the cavity and then swings in a direction to stretch the breast portion of each bird across the cavity and away from the bird's suspended hocks, and an elongated longitudinally downwardly inclined relatively stationary severing blade held at the severing zone below the overhead shackle line and somewhat above said endless substantially horizontal conveyor and being inclined across the movement path of the endless conveyor and having a bottom cutting edge adapted to sever each bird cleanly into two sections during its passage through the severing zone.

4,557,016

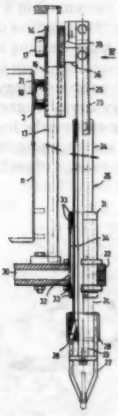
WASHING APPARATUS FOR THE INTERNAL RINSING OF POULTRY CARCASSES

Heinrich W. Markert, P.O. Box 159, 6710 BD Ede, Netherlands

Filed Oct. 21, 1983, Ser. No. 544,357
Int. Cl.[4] A22C *21/00*
U.S. Cl. 17—11 6 Claims

1. A washing apparatus for rinsing the innards of poultry carcasses including a stationary central part which includes a vertically placed drum, a frame suspended around said drum, and being concentrically rotatable, said frame carrying a number of vertically displaceable members which communicate with means for the supply of spraying water, each member being provided with spraying means for supplying water to the interior of a carcass and with at least one dilator means for keeping an aperture of the carcass being treated open to ensure proper flushing of the sprayed water, the said drum being provided with guiding means and the said members being

provided with at least one guide roller means operating in conjunction with the guiding means for directing the members



in a predetermined pattern of vertical motion during the rotation of the frame.

4,557,017

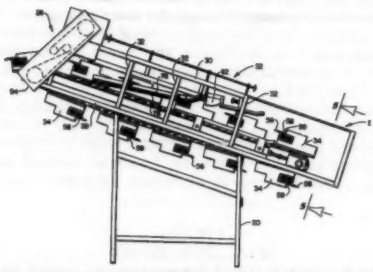
APPARATUS FOR FILLETING MEAT FROM POULTRY BREAST SECTIONS

Geno N. Gasbarro, 1305 Noe Bixby Rd., Columbus, Ohio 43227

Continuation-in-part of Ser. No. 421,814, Sep. 23, 1982, abandoned, which is a continuation of Ser. No. 281,788, Jul. 10, 1981, abandoned. This application Nov. 3, 1983, Ser. No. 548,346

Int. Cl.[4] **A22C** *17/04, 21/00*

U.S. Cl. 17—11 **4 Claims**



1. An automatic apparatus for separating the meat from a pre-cut poultry breast section comprising, in combination, a base means provided with an upper, longitudinally extending support frame; a plurality of mandrels mounted in spaced relationship on an endless chain mounted on said support frame for generally parallel longitudinal movement along said frame, said mandrels adapted to receive a poultry breast section with the meat portion facing upwardly; retaining guide means mounted on said support frame above a portion of the path of travel of said mandrels for force-transmitting engagement with a poultry breast section mounted on said mandrels; a pair of knife means longitudinally disposed on said frame means along the path of travel of said mandrels for engagement with a poultry breast portion along each side of the keel bone in said breast portion retained upon one of said mandrels; a pair of resilient stripper members mounted on said frame means adjacent to the downstream end of said knife means and extending longitudinally along the path of travel of said mandrels, each of said members including a laterally extending surface terminating in an inner edge portion extending toward one another and defining between said edge portions a longitudinally extending opening of predetermined width aligned to receive the keel bone portion of a breast section mounted on said mandrels and having a progressively downward vertical inclination relative to the path of travel of said mandrels, the inner edge portions of said stripping members disposed for yielding force-transmitting engagement with the approximate point of junction between the meat and bone portions of said breast sections to forcibly separate the meat from the bone portion as the breast section on said mandrel advances along said opening; and means to separately collect the meat and bone portions after separation has occurred.

4,557,018

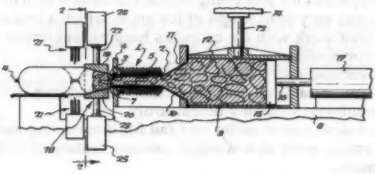
MEAT FORMER APPARATUS

Thomas W. Martinek, Covington, Ind., assignor to Teepak, Inc., Oak Brook, Ill.

Filed Jul. 9, 1984, Ser. No. 629,031

Int. Cl.[4] **A22C** *7/00, 11/06*

U.S. Cl. 17—49 **17 Claims**



1. An improved arrangement for the forced stuffing of meat through a tubular filling nozzle means into a tubular meat casing means wherein the internal diameter of the filling nozzle means, at its discharge end, is smaller than the internal diameter of the meat stuffed tubular casing means, the improvement comprising, having disposed around at least a portion of the exterior surface of the tubular casing means, between said smaller diameter filling nozzle means and said larger diameter meat stuffed casing means, a truncated, internally conical extending meat former device having a smallest internal diameter approximately equal to or greater than said internal diameter of said filling nozzle means and being disposed proximate thereto, said former device having progressively larger internal diameters through its truncated length wherein the truncated length of said meat former device, contacting said casing between said larger and said smaller diameter is sufficient so that the internal angle of said conically extending meat former device from its internal axis is less than about 35°.

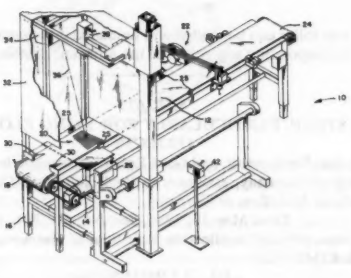
15. A method of controlling the relative displacement of meat into a meat casing means wherein meat pieces are prearranged in related position, forced through a filling nozzle and stuffed into said meat casing means, the method comprising disposing around said meat casing means and between said filling nozzle and the stuffed casing, a meat former comprising a truncated internally conical extending device having a smallest internal diameter approximately equal to or greater than the internal diameter of the filling nozzle and arranged proximate thereto and at least one large diameter approximately equal to or less than the external diameter of the stuffed meat casing, wherein the internal angle of the interior surface of said conically extending truncated meat former, from its internal axis at points where it contacts the casing is not greater than about 35°, and extruding said meat through said nozzle and said meat former means at a pressure so that a major portion of the flow of said extruded meat from the nozzle to the stuffed sausage casing occurs without relative displacement of the meat from its prearranged related position.

4,557,019

AUTOMATIC PORTION-CUTTING METHOD AND MACHINE

Douglas E. Van Devanter; Kelly R. Moore, and James S. Tomlin, all of King County, Wash., assignors to Seafreeze Limited Partnership, Seattle, Wash.

Filed Aug. 10, 1984, Ser. No. 640,006
Int. Cl.[4] A22C 25/18; B26D 5/34
U.S. Cl. 17—52 6 Claims



4. An apparatus for automatically cutting fish fillets to mark portions of a preselected weight, which comprises:

an elongated conveyor for transporting fillets along the apparatus in a downstream direction;

means for measuring the shape of fillets travelling on the conveyor at spaced apart locations along the conveyor;

a cutting unit adjacent the conveyor at a location spaced apart from and downstream with respect to the measuring means, the cutting unit movable across the conveyor to cut fillets travelling on the conveyor; and

a processing unit communicating with the measuring means to receive the fillet shape data generated thereby, the processing unit using the data to calculate the volume and corresponding weight of incremental weights and compare the total to a preselected portion weight, the processing unit actuating the cutting unit to cut the fillets at locations corresponding to portions substantially equal to the preselected portion size.

6. A method of automatically cutting fish fillets into portions of a predetermined weight which comprises the steps of:

placing the filet on an elongated conveyor;

projecting a plurality of parallel spaced apart light beams onto the conveyor;

monitoring the conveyor to record the location of the light beams on the conveyor when no fillet is present;

monitoring the location of the light beams at a preselected time increment as a fillet passes under the light beams;

comparing the location of the light beams with and without a fillet present to develop a series of height contours for the fillet;

computing the incremental weights of the fillet and comparing the cummulative totals to the predetermined portion weight; and

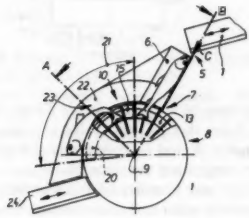
actuating a cutting mechanism adjacent the conveyor to cut the fillet at locations corresponding to the preselected portion size.

4,557,020

DEVICE FOR ALIGNING FISH

Werner Wenzel, Lübeck, Fed. Rep. of Germany, assignor to Nordischer Maschinenbau Rud. Baader GmbH & Co. KG, Lübeck, Fed. Rep. of Germany

Filed Aug. 3, 1983, Ser. No. 520,111
Claims priority, application Fed. Rep. of Germany, Aug. 7, 1982, 3229502
Int. Cl.[4] A22C 25/08
U.S. Cl. 17—55 5 Claims



1. A device for arranging in uniform head-tail alignment, a plurality of fish each having a body extending along a longitudinal axis between a head end and a tail region ending in a tail end, with said fish being led to said device along their longitudinal axes in a random head-leading and tail-leading orientation, and with said device being adapted to turn such fish as are led thereto with tail end leading to a head-leading position, said device comprising:

a feeding channel for receiving individually each of said fish led to said device,

seizing and turning means for seizing the tail region of such fish as are received in the feeding channel in tail-leading position, and for turning such fish to head-leading position,

outlet means for delivering said fish from said device,

said feeding channel communicating with said seizing and turning means at a first junction position, and said outlet means communicating with said seizing and turning means at a second junction position,

said seizing and turning means including a gripping member rotatably mounted about a substantially horizontal axis of rotation, said gripping member being formed with a plurality of gripping elements extending about the periphery thereof,

said seizing and turning means also including a rigid gripping plate normally spaced from said gripping member and defining a clamping slot therebetween, with said feeding channel and said outlet means communicating with said clamping slot,

said gripping member being rotatable relative to said gripping plate to move said gripping elements through a stationary sector extending between said first and second junction positions,

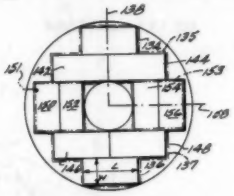
and means for deforming said gripping elements inwardly toward said gripping plate in said stationary sector, whereby to reduce the width of said clamping slot and cause said gripping elements to grip a fish tail portion located within said slot against said gripping plate,

at least one of said gripping member and gripping plate being formed with a bevelled peripheral surface forming a tapered recess leading to said clamping slot.

4,557,021
LAYING OUT AND OPENING OF FIBER BALES

Ronald S. Nash, and L. Dale Cash, both of Gastonia, N.C., assignors to Fiber Controls Corporation, Gastonia, N.C.

Filed Mar. 31, 1981, Ser. No. 249,408
Int. Cl.[4] D01G *13/00*
U.S. Cl. 19—80 R 9 Claims



1. The process of stripping textile fibers off the tops of a plurality of bales thereof, said bales having a predetermined width dimension W and a predetermined length dimension L, said process comprising the steps of:

laying down said plurality of bales entirely in the annular area between outer and inner concentric circles including first and second bale sections symmetrically opposing one another about a first axis of symmetry which passes through the coincident center points of said outer and inner circles, and third and fourth bale sections disposed between said first and second bale sections and symmetrically opposing one another about a second axis of symmetry which perpendicular to said first axis at said center points,

said laying down including disposing three bales in each of said first and second bale sections, one of said three bales in each of said first and second sections being laid down parallel to said first axis of symmetry so as to have its said length dimension L substantially bisected by said second line of symmetry, the remaining two bales being laid down end to end in an abutting manner between said one bale and said inner circle, the abutting ends of said two bales defining a line colinear to said second axis of symmetry; and

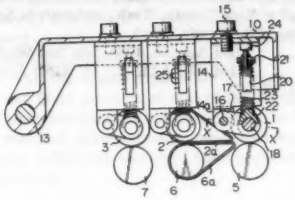
stripping fibers from the laid down bales by cyclically moving a rotating beater, which is disposed in a radial position between said circles, over the tops of said plurality of bales and conintually lowering the beater until a desired amount of stripped fibers is obtained.

4,557,022
DRAFTING MEANS FOR TEXTILE MACHINE SUCH AS SPINNING MACHINE

Toshio Morishita, Kariya; Yoshiharu Yasui, Toyota; Yoshihisa Suzuki, Chiryu; Kazuo Seiki, Kariya, and Haruyoshi Nakamura, Obu, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Aichi, Japan

Filed May 16, 1984, Ser. No. 610,633
Claims priority, application Japan, May 20, 1983, 58-89756; May 20, 1983, 58-89757; May 21, 1983, 58-76783[U]
Int. Cl.[4] D01H *5/50*
U.S. Cl. 19—267 6 Claims

1. In a textile machine comprising a spinning machine, said spinning machine comprising a plurality of spinning stations, drafting means for said spinning stations comprising a plurality of pairs of top and bottom rollers, each top roller being grouped in a pair with a corresponding top roller for the adjacent drafting means and urged toward a companion bottom roller by means of a loading device provided for every two adjacent drafting means, characterized in that said pair of top rollers is supported in said loading device in such a manner that

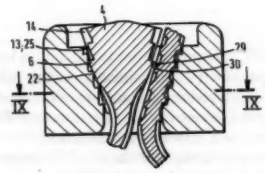


said top roller can be loaded and unloaded independently from the corresponding top roller of the adjacent drafting means.

4,557,023
TIE STRAP, PARTICULARLY FOR TYING ELONGATED OBJECTS

Jörg Six, Norderstedt, and Gerd Kobarg, Tornesch, both of Fed. Rep. of Germany, assignors to Paul Hellerman GmbH, Pinneberg, Fed. Rep. of Germany

Filed May 15, 1984, Ser. No. 610,389
Claims priority, application Fed. Rep. of Germany, May 17, 1983, 8314534[U]
Int. Cl.[4] B65D *63/00*
U.S. Cl. 24—16 PB 4 Claims



1. A tie strap, particularly useful for tying elongated objects, such as wiring harnesses, comprising, a strap tongue having at least one end, teeth disposed on both sides of said tongue, a clamp wedge having a thinner end and a thicker end, said wedge being joined by its thinner end to one end of the strap tongue and being toothed on both wedge surfaces, a clamp head having a clamp opening bounded by two opening surfaces which lie opposite one another and converge in the shape of a wedge, one of said surfaces being configured and dimensioned to support the wedge and the other surface forming, in conjunction with said one wedge surface, a clamp gap for said strap tongue , and teeth disposed on said surfaces.

4,557,024
CLAMP FOR HOSE, TUBING, OR THE LIKE

George E. Roberts, Fort Lauderdale, Fla., and Robert L. Waddington, London, England, assignors to 501 Evelyn Investments Ltd., New York, N.Y.

Filed Feb. 6, 1984, Ser. No. 577,293
Int. Cl.[4] F16L *33/22*
U.S. Cl. 24—20 TT 50 Claims

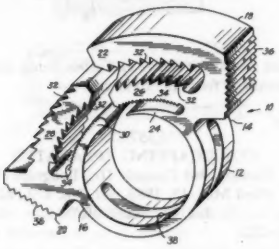
1. A unitary clamp for applying clamping forces to the exterior surface of an object having a generally arcuate cross-sectional configuration, which comprises:

(a) a flexible band in the form of an open ring having opposed end portions and defining an inner arcuate portion;

(b) a first band end connected to a first end portion of said flexible band, said first band end including at least three inwardly projecting extensions; and

(c) a second band end connected to the opposite end portion

of said flexible band, said second band end including at least two extensions projecting inwardly toward said extensions of said first band end and configured to engage therewith, said inwardly projecting extensions being configured, positioned, and oriented such that when said band ends are moved toward each other, said extensions become engaged with each other in a manner to maintain the clamp in a closed condition whereby said inner arcuate



portion of said flexible band assumes a cross-sectional configuration corresponding to the cross-sectional configuration of the object to be clamped and contacts the outer surface thereof, and wherein said inwardly projecting extensions of said first band end are positioned in relatively upper, intermediate, and lower spaced positions, the lower position being closest to the center of the flexible band, and the spacing being sufficient to engagingly receive the extensions of said second band end.

4,557,025

AUTOMATIC SEAMING MACHINE

Steven Eglin, Accrington, England, assignor to Scapa-Porritt Limited, Blackburn, England

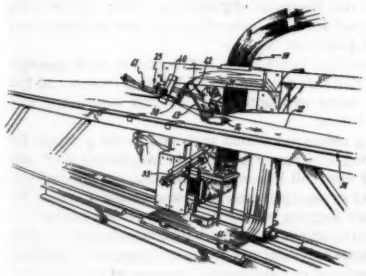
PCT No. PCT/GB83/00206, § 371 Date Apr. 19, 1984, § 102(e) Date Apr. 19, 1984, PCT Pub. No. WO84/00782, PCT Pub. Date Mar. 1, 1984

PCT Filed Aug. 19, 1983, Ser. No. 604,624

Claims priority, application United Kingdom, Aug. 20, 1982, 8224063

Int. Cl.⁴ D21F *1/00*

U.S. Cl. 28—141 **16 Claims**



1. Apparatus for use in the mechanical seaming of opposed fabric ends comprising a shedding mechanism to receive and support a weft structure extending in the longitudinal direction of the intended seam and to effect shedding thereof in accordance with requirements, and guide means locating a respective fringe of side-by-side warp yarns at each respective fabric end in requisite adjacent disposition relative to each other and to the said weft structure, characterised by shed finger means (19, 98, 113) selectively engageable with a weft structure (17) carried by the shedding mechanism and adapted upon actuation, to enlarge the shed (20) adjacent the fell (21) of the woven seam for the time being existing, yarn engagement means (25, 125) selectively engageable with successive individual ones of the side-by-side warp yarns (28), at respective opposite sides of the machine, and yarn insertion means (26, 121) having a path of movement to engage a warp yarn (28) engaged by the yarn engagement means (25, 125) and adapted, upon actuation, to insert such yarn into the shed (20).

4,557,026

METHOD FOR PRODUCING AN INTERLACED MULTIFILAMENT YARN

Tadayuki Matsumoto, Mishima; Kozo Imaeda, Shizuoka; Masatoshi Mineo, and Kiyoshi Nakagawa, both of Mishima, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

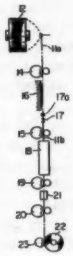
Continuation of Ser. No. 304,322, Sep. 21, 1981, Pat. No. 4,439,903, which is a continuation of Ser. No. 22,934, Mar. 22, 1979, Pat. No. 4,365,394, which is a division of Ser. No. 865,667, Dec. 29, 1977, abandoned, which is a division of Ser. No. 705,145, Jul. 14, 1976, Pat. No. 4,115,988. This application Apr. 26, 1982, Ser. No. 371,774

Claims priority, application Japan, Jul. 18, 1975, 50-87372

The portion of the term of this patent subsequent to Dec. 28, 1999, has been disclaimed.

Int. Cl.⁴ D02G *1/20, 1/16;* D02J *1/08, 1/16*

U.S. Cl. 28—258 **4 Claims**



1. The method for producing an interlaced multifilament yarn comprising, in combination:

rubbing and scratching a material multifilament yarn with such intensity that individual filaments constituting said filament yarn are not substantially broken by a rotary rough surface member having sharp projections which are smaller than the cross-sectional diameter of the individual filaments of said material yarn to thereby increase the interlacing ability of the yarns;

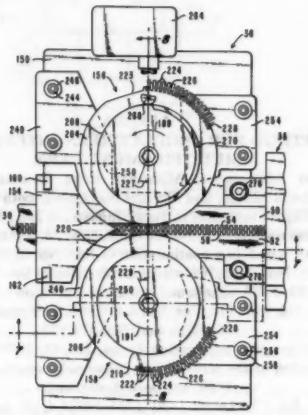
subsequently diffusing at least one jetted fluid, jetted in the yarn running direction along a predetermined yarn passage from a jetting aperture of a supply conduit through a nozzle formed with a rectifying and diffusing portion having a substantially uniform cross-section and being open at both ends and extending through the length of the yarn passage: said supply conduit being fixed with respect to members defining said yarn passage and

impinging said diffused jetted fluid against said running material multifilament yarn so that said individual filaments of said multifilament yarn mostly vibrate in a direction substantially parallel to a plane defined by the yarn running direction and the fluid jetting direction, the vibration taking place in a section of said yarn passage facing said rectifying and diffusing portion.

4,557,027
SLIDE FASTENER CHAIN APPARATUS OF MANUFACTURE

Harry M. Fisher, Whitestone, and Stuart N. Fisher, Floral Park, both of N.Y., assignors to Talon, Inc., Meadville, Pa.

Division of Ser. No. 304,450, Sep. 21, 1981, Pat. No. 4,413,398.
This application Sep. 13, 1983, Ser. No. 531,873
Int. Cl.⁴ B23P *19/00*
U.S. Cl. 29—33.2 7 Claims



1. An apparatus for forming a gap in a slide fastener chain having a pair of coplanar support tapes and rows of spaced molded interlocking coupling elements secured to inner edge portions of the tapes wherein leg portions of the coupling elements protrude above and below the inner edge portions of the tapes, comprising

a pair of spaced-apart parallel shafts,

means for rotating the shafts in opposite directions,

first and second pairs of cutting disks mounted on the respective shafts where each pair of cutting disks includes an upper cutting disk coplanar with the upper cutting disk of the other pair and a lower cutting disk coplanar with the lower cutting disk of the other pair,

said upper and lower cutting disks of each pair of cutting disks being spaced apart for receiving the tapes of the slide fastener therebetween, and

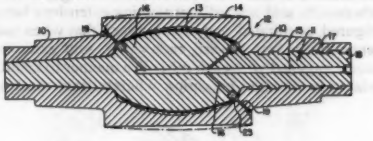
said first and second pairs of cutting disks having respective first peripheral portions which when rotated to face each other are spaced apart by a distance slightly greater than a width of the interlocking coupling elements, and having respective second peripheral portions including cutting means projecting radially generally coplanar with respective opposite surfaces of the inner edge portions of the tapes for severing leg portions of the coupling elements from the slide fastener tapes.

4,557,028
COMPOSITE INFLATABLE CROWN ROLL

Werner W. Elbe, Pittsburgh, Pa., assignor to White Consolidated Industries, Inc., Cleveland, Ohio

Filed May 2, 1983, Ser. No. 490,254
Int. Cl.⁴ B21B *29/00*
U.S. Cl. 29—113 R 8 Claims

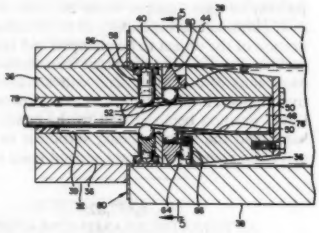
1. In an inflatable crown roll comprising an arbor member and a sleeve having a working face, said sleeve fitting closely on the arbor under the working face of said sleeve so as to leave a circumferential cavity between sleeve and arbor for receiving a fluid under pressure, the improvement comprising at least one of said members being a casting which is cast against the other member to fuse the sleeve to the ends of the arbor and form the sleeve and having a radial dimension substantially that due to the sleeve and arbor being sealed together to prevent leakage from the cavity.



4,557,029
CORE CAPPING APPARATUS

Richard M. Stewart, 944 Cascade Dr., Longview, Wash. 98632

Filed Mar. 15, 1983, Ser. No. 473,281
Int. Cl.⁴ B23P *19/04*
U.S. Cl. 29—253 10 Claims



1. A capping head for fixing a conforming sleeve within a tubular member comprising:

(a) a substantially solid shell having a longitudinal bore and radial passages, said shell being capable of substantially fitting within said conforming sleeve;

(b) forming means arranged peripherally of said shell and radially movable with respect to said shell between extended and retracted positions for deflecting a portion of said sleeve to deformably engage said tubular member;

(c) tapered ram means axially slidable within said bore for moving said forming means between said extended and retracted positions;

(d) ball bearings operatively interposed in said passages between said ram means and said forming means, said ball bearings being unattached to said ram means and said forming means;

(e) retaining means associated with said forming means for maintaining said forming means in association with said shell and said ball bearings within said passages of said shell, said retaining means including resilient means for urging said forming means to said retracted position; and

(f) said forming means including longitudinally spaced apart punch means and independent crimping means for deflecting a significant circumferential segment of said sleeve to deformably engage said tubular member.

4,557,030
MULTIPURPOSE APPARATUS AND METHOD FOR TUNING AND GROOVING A SKI

John C. Gaston, and Richard K. Fairall, both of 2640 N. 54th Pl., Phoenix, Ariz. 85008

Filed Jun. 7, 1984, Ser. No. 618,087
Int. Cl.⁴ B21K *21/00*
U.S. Cl. 29—402.06 17 Claims

1. A multipurpose ski apparatus, comprising:

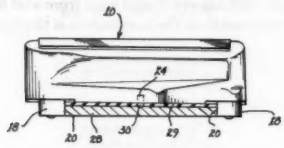
a gripping body;

first filing means fastened to said gripping body for filing the bottom of a ski;

scraping means operably attached to said gripping body for scraping wax and other material off said ski; and

second filing means rotatably coupled to said gripping body for filing the sides of said ski.

15. A method of preparing a ski, comprising the steps of:



scraping the wax off the bottom surface of said ski by a metal scraper fastened to an apparatus;

after scraping said ski, filing said bottom surface with a file fastened to said apparatus; and

subsequent to filing said bottom surface, simultaneously filing the sides of said ski with two files rotatably coupled to said apparatus.

4,557,031

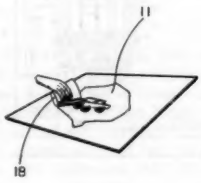
PROCESS FOR PRODUCING PERMANENT ART WORK DISPLAY

Charles R. Winkler, P.O. Box 2161, Kill Devil Hills, N.C. 27948

Filed Oct. 24, 1983, Ser. No. 544,721

Int. Cl.⁴ B23P *11/00*

U.S. Cl. 29—432 **9 Claims**



1. A preserving process comprising:

providing wearing apparel fabric containing a normally limited life art work thereon; cutting a swatch containing said art work from said apparel; placing the swatch on a backing means having edges; smoothing out the swatch to remove wrinkles therefrom without distorting the art work; folding the swatch over the edges of the backing; securing the swatch to the backing means at points other than the side having the art work thereon, whereby the art form bearing swatch is mounted on the backing means; combining a reactive resin and a hardener to form a curable resin compound, said resin compound being transparent when cured; pouring the resin compound generally in the center of the art work; evenly spreading the resin toward the edges of the mounted swatch with penetration of the fabric and without air bubbles; and allowing the spread resin compound to cure whereby the normally limited life art work is permanently preserved by being penetratingly encapsulated by said transparent compound.

4,557,032

METHOD OF MAKING A BELT TENSIONER

Leslie B. Wilson, Reeds Spring, Mo., assignor to Dayco Corporation, Dayton, Ohio

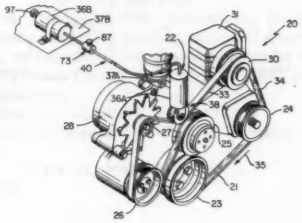
Division of Ser. No. 296,693, Aug. 27, 1981, Pat. No. 4,466,803.

This application May 25, 1984, Ser. No. 613,947

The portion of the term of this patent subsequent to Aug. 21, 2001, has been disclaimed.

Int. Cl.⁴ B23P *11/00*

U.S. Cl. 29—434 **13 Claims**



8. In a method of making a tensioner for an endless power transmission belt, said method comprising the steps of providing means for fixing said tensioner relative to said belt, providing movable belt engaging means associated with said tensioner for engaging said belt, operatively associating mechanical spring means with said tensioner for urging said belt engaging means against said belt with a force to tension said belt, the improvement comprising the steps of; operatively associating a first piston and cylinder means with said spring means remote from said belt engaging means, operatively associating a second piston and cylinder means with said belt engaging means; interconnecting said first and second piston and cylinder means by a conduit whereby said spring means provides a constant force against said first piston which tends to push fluid means from said first cylinder into said conduit and into said second cylinder, said fluid means in said second cylinder forcing said second piston to urge said belt engaging means against said belt; said first and second piston and cylinder and said conduit comprising a fluid operated transmitting means which transfers the forces of said spring to said belt engaging means from a position remote from said tensioner.

4,557,033

METHOD OF COLD EXPANDING AND SIZING FASTENER HOLES

Robert L. Champoux, Bellevue, Wash., assignor to Fatigue Technology, Inc., Seattle, Wash.

Filed Jul. 11, 1983, Ser. No. 512,131

Int. Cl.⁴ B23P *19/02;* **B21B** *17/02*

U.S. Cl. 29—525 **31 Claims**

1. A method of fastening a plurality of metal members together, comprising:

drilling a precision hole of a predetermined diameter through the metals which are to be connected together;

cold expanding the drilled hole in the members by pulling a mandrel through the hole to both improve the fatigue performance of the metal surrounding the hole and to size the hole the final hole diameter after expansion is equal to the starting hole diameter plus the retained expansion; there being spring back shrinkage of the expanded hole to the retained expansion; said hole being sized by expanding the hole to at least a critical sizing expansion value which is a value of expansion beyond which the retained expansion value is linearly exceeded and to less than the same amount as the total expansion before elongation of the hole axis of the metal surrounding the hole; and

installing a fastener to fit in the hole.

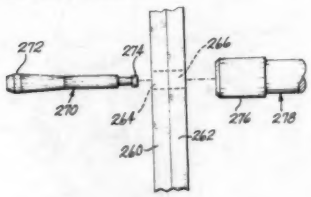
20. A method of cold expanding and sizing a hole in a metal

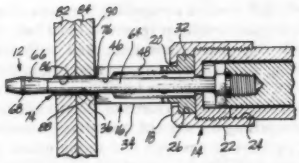
workpiece to achieve the desired fit of a predetermined fastener, comprising:

drilling a starting precision hole having a predetermined diameter;

cold expanding the drilled hole to both improve the fatigue performance of the metal surrounding the hole and to size the hole;

said cold expanding of the drilled hole in the workpiece is by placing a split sleeve in the hole and pulling a mandrel through the split sleeve;





the final hole diameter after expansion being equal to the starting hole diameter plus the retained expansion, therebeing spring back shrinkage of the expanded hole to the final hole diameter;

said hole being sized by expanding the hole to at least a critical sizing expansion value which is a value of expansion beyond which the retained expansion value is linearly exceeded and to less than the same amount as the total expansion before elongation along the hole axis of the metal surrounding the hole.

4,557,034

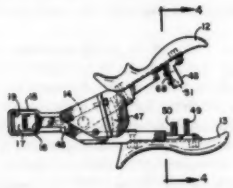
TOOL FOR MOUNTING CONNECTORS TO MULTI-CONDUCTOR CORDS OR WIRES

William N. Pfundt, Washington Crossing, Pa., assignor to General Machine Products Company, Inc., Trevose, Pa.

Filed Oct. 25, 1982, Ser. No. 545,059

Int. Cl.⁴ H01R *43/04*

U.S. Cl. 29—566.4 **8 Claims**



5. A hand tool for use with a flat multi-conductor wire comprising a sheath and a plurality of co-planar conductors, comprising a pair of handles and wire stripper means for stripping the sheath from said conductors at the free end of the wire, said stripper means including upstanding yoke means carried by one of said handles comprising a pair of guide members spaced-apart longitudinally of said wire and having slot means with co-planar centerlines to receive said wire and position said coplanar conductors along the coplanar centerlines of said slot means, and slicing means actuated by the other of said handles comprising an element displaceable between said guide members and having a pair of blade edges adapted to move generally parallel to and on opposite sides of the plane of said centerlines to slice into the sheath of the wire along opposite sides of said conductors between said guide members, so that upon axial withdrawal of said wire from said blade edges, the sheath is stripped from the conductors at the free end of the wire.

4,557,035

MACHINE TOOL WITH TOOL MAGAZINE

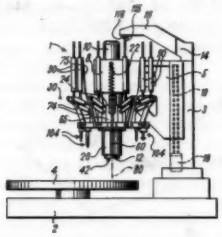
Eugen Rütschle, Mühlheim; Hans-Henning Winkler, and Rudolf Haninger, both of Tuttlingen, all of Fed. Rep. of Germany, assignors to Chiron-Werke GmbH, Tuttlingen, Fed. Rep. of Germany

Filed Sep. 2, 1983, Ser. No. 529,202

Claims priority, application Fed. Rep. of Germany, Sep. 13, 1982, 3233934; Jun. 9, 1983, 3320851

Int. Cl.⁴ B23Q *3/157*

U.S. Cl. 29—568 **14 Claims**



1. Machine tool for sequentially machining the pieces with different tools which may be clamped in a spindle of the machine tool, with a magazine in which the tools are disposed in a ring pattern around the spindle axis and held in holders, each holder being provided with its own drive which moves it in a position where it is aligned with a spindle axis (clamping position) and into a position outside the spindle axis (magazine position), the said holders being retained in a common carrier which is connected to the spindle head of the machine guiding the spindle in such a manner that the carrier is shiftable parallel to the spindle axis and is in a fixed position relatively to the spindle head during the cutting operation of the machine tool and is moved parallel to the spindle axis relatively to the spindle head during the tool change, wherein the holder remains in alignment with the spindle axis during the cutting operation of the tool associated with that holder, the carrier has only two shift positions relative to the spindle head, namely one shift position, in which the tool is inserted into the spindle and the machine tool works, and the other shift position, in which the tool held by the holder in alignment with the spindle axis is completely free, and the drive for each holder comprises a parallel guide comprising two links.

4,557,036

SEMICONDUCTOR DEVICE AND PROCESS FOR MANUFACTURING THE SAME

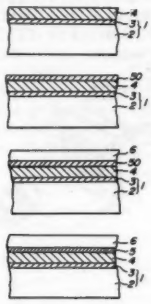
Hakaru Kyuragi, Tokorozawa, and Hideo Oikawa, Koganei, both of Japan, assignors to Nippon Telegraph & Telephone Public Corp., Tokyo, Japan

Filed Mar. 25, 1983, Ser. No. 479,135

Claims priority, application Japan, Mar. 31, 1982, 57-51382; Mar. 31, 1982, 57-51383

Int. Cl.⁴ H01L *21/28*

U.S. Cl. 29—571 **8 Claims**



1. A process for manufacturing a semiconductor device, comprising the steps of:

(1) applying a refractory metal layer onto a base;

(2) forming a refractory metal oxide layer on the surface of said refractory metal layer;

(3) forming a silicon layer on said refractory metal oxide layer; and

(4) annealing the resulting structure in an atmosphere containing hydrogen to form an internally oxidized silicon layer substantially at the interfaces of said refractory metal layer and said silicon layer.

4,557,037

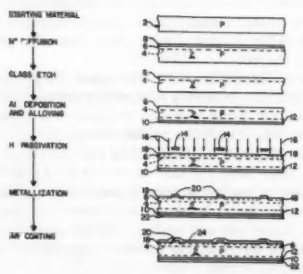
METHOD OF FABRICATING SOLAR CELLS

Jack I. Hanoka, Brookline; Douglas A. Yates, Burlington, and James A. Gregory, Sudbury, all of Mass., assignors to Mobil Solar Energy Corporation, Waltham, Mass.

Continuation-in-part of Ser. No. 666,973, Oct. 31, 1984, abandoned, which is a continuation of Ser. No. 563,132, Dec. 19, 1983, abandoned. This application Dec. 13, 1984, Ser. No. 681,498

Int. Cl.⁴ H01L *31/18*

U.S. Cl. 29—576 B **9 Claims**



1. Method of fabricating solid state semiconductor devices comprising in sequence the steps of:

(a) providing a silicon substrate having opposing first and second surfaces;

(b) positioning a mechanical mask having selected apertures in juxtaposition to said first surface; and

(c) exposing said first surface to a hydrogen ion beam through said selected apertures at an intensity and for a duration sufficient to form a surface layer on said first surface corresponding to said apertures and to which metals will only poorly adhere.

4,557,038

INSTALLING A PREFABRICATED WINDING OF A LINEAR MOTOR

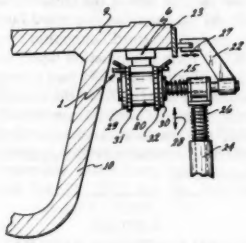
Manfred Weisio, Ottobrunn; Otto Breitenbach, Nuremberg; Friedrich Schatz, and Ulrich Riepling, both of Wedemark, all of Fed. Rep. of Germany, assignors to Kabelmetal Electro GmbH, Hanover and Thyssen Industrie AG, Essen, both of, Fed. Rep. of Germany

Filed Jun. 27, 1984, Ser. No. 625,446

Claims priority, application Fed. Rep. of Germany, Jul. 1, 1983, 3323696

Int. Cl.⁴ H02K *15/085*

U.S. Cl. 29—596 **8 Claims**



1. Method of applying and fastening a prefabricated polyphase cable-winding assembly into the grooves of an inductor pertaining to a stator for a linear motor arranged along the underside of an overhung carrier, and wherein said grooves are arranged in parallel to each other essentially transverse to the linear extension of the stator, and wherein the cable-winding assembly resembles a ladder and cable portions resemble the rungs of a ladder comprising the steps of:

providing the cable assembly on a drum, the drum being placed on a vehicle, the vehicle running on said carrier;

unreeling said cable assembly from the drum as the vehicle runs on said carrier;

deflecting said cable assembly as unreeled through outrigger means and providing it to run towards said underside of said carrier in near-tangential fashion; and

causing a tool to engage said cable-winding so as to force said near-tangentially running cable assembly progressively into said groove.

4,557,039

METHOD OF MANUFACTURING TRANSFORMER CORES

Laurence Manderson, Sherwood, Australia, assignor to Susan V. Manderson, Australia

Continuation-in-part of Ser. No. 86,321, Oct. 19, 1979, abandoned. This application Jul. 20, 1982, Ser. No. 400,000

Int. Cl.⁴ H01F *41/00*

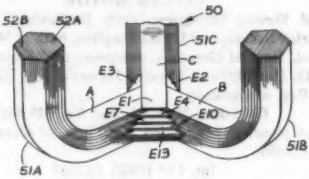
U.S. Cl. 29—605 **4 Claims**

1. A method of manufacturing a transformer core from electrical steel strip wherein said core comprises three frames each of substantially C shape in side view, the frames being arranged substantially 120° apart, comprising:

cutting a first strip of increasing constant taper from a minimum width to a maximum width;

cutting a second strip having a decreasing constant taper from a maximum width to a minimum width;

cutting each strip into a plurality of lamination lengths, each group of three lamination lengths being separated from the adjacent group at an end which is cut at substantially 90° to its longitudinal axis, each said group forming a layer of the core, with three lamination lengths in the group being separated from each other by cuts at substantially 60° to the longitudinal axis, the length dimensions of each layer being predetermined as a function of strip width of the layer such that the length dimensions vary in a non-linear manner from layer to layer;



butt joining the ends of two of the lamination lengths cut at substantially 60° to the sides of a third lamination length adjacent an end of the third lamination length cut at substantially 90° to form a lamination layer; and

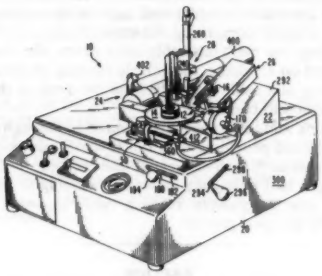
assembling the lamination layers by butt joining the free ends of each lamination layer to form the assembled core such that the cross section of each substantially C-shaped frame is polygonal, and the side elevational profile of the exposed end of each substantially C-shaped frame is substantially wedge-shaped.

4,557,040

ALIGNMENT AND INSERTION APPARATUS FOR AN INFORMATION-CONTAINING DISC STYLUS

David W. Fairbanks, So. Brunswick Twp., Middlesex County, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Apr. 19, 1984, Ser. No. 602,156
Int. Cl.⁴ B23P *21/00*; B23Q *15/00, 7/10*
U.S. Cl. 29—720 **10 Claims**



1. Apparatus for aligning and inserting an information-containing-disc stylus into a stylus holder comprising:

(a) holder means for holding said stylus holder;

(b) positioning means for positioning said stylus with respect to said stylus holder comprising: a stylus receiving chamber having a longitudinal axis arranged so that when said stylus is inserted into said stylus receiving chamber said longitudinal axis is coaxial with said stylus, said stylus receiving chamber being arranged to pivot about said longitudinal axis;

(c) loading means for placing said stylus into said positioning means;

(d) inserting means for inserting said stylus into said stylus holder; and

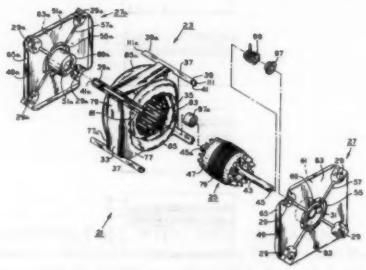
(e) light beam means for indicating a desired position of said stylus with respect to said stylus holder.

4,557,041

APPARATUS FOR ASSEMBLING A DYNAMOELECTRIC MACHINE

Robert W. White, and Frank R. Kuzan, both of DeKalb, Ill., assignors to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 402,282, Jul. 27, 1982, Pat. No. 4,480,378.
This application May 23, 1984, Ser. No. 613,135
Int. Cl.⁴ H02K *15/14, 15/16*
U.S. Cl. 29—732 **12 Claims**



1. Apparatus for assembling a dynamoelectric machine having a stationary assembly and a rotatable assembly, the stationary assembly including a stator having a bore therethrough, a set of beams secured to the stator and having a pair of opposite ends with a pair of oppositely extending tabs thereon, respectively, a pair of opposite end frames having a pair of sets of apertures therethrough with the apertures being sized predeterminately larger than the tabs, respectively, and at least one of the end frames having a generally central opening therethrough, the rotatable assembly including a shaft having a pair of opposite end portions with a rotor secured to the shaft between the opposite end portions thereof, the apparatus comprising:

supporting means disposed in a stationary position in the apparatus for seating the at least one end frame;

means on said supporting means for engagement with at least a part of the at least one end frame to locate it generally in a preselected position on said supporting means;

recess means associated with said supporting means for receiving one of the opposite ends of said shaft with the one opposite end portion of the shaft extending through the generally central opening in the at least one end frame and for aligning the rotatable assembly in a preselected position generally along a preselected axis;

means associated with said supporting means for locking engagement with the one opposite end portion of the shaft received in said recess means so as to maintain the rotatable assembly against displacement from the preselected position thereof;

means for advancing a set of shims generally about the rotor of the rotatable assembly when in its preselected position, said shim set being engaged between the rotor and the stator bore to establish a preselected air gap therebetween upon the disposition of the stator bore about said shim set and the rotor with the tabs on one of the opposite ends of the beams extending at least in part into one of the aperture sets in the at least one end frame in spaced apart relation therefrom and with one of the opposite ends of at least one of the beams in seating engagement with the at least one end frame, respectively;

means movable in the apparatus for resiliently urging the other of the end frames toward seating engagement with the other of the opposite ends of at least two of the beams when the other of the aperture sets in the other end frame are arranged generally about the other of the tabs on the

other opposite ends of the beams in spaced apart relation therewith, respectively, and

a pair of sets of means for generally simultaneously welding at least a part of each tab of the one and other tabs to a part of the at least one end frame and other end frame at least generally adjacent each aperture of the one and other aperture sets with the tabs and the aperture sets in the spaced apart relation thereof, respectively.

4,557,042

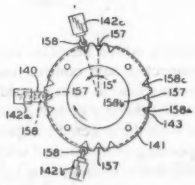
AUTOMATIC SYSTEM FOR COMPRESSING COIL TURNS AND INSERTING INSULATORS IN SLOTS OF A SLOTTED STATOR CORE

Alan L. Kindig, Holland, Mich., assignor to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 365,936, Apr. 5, 1982, Pat. No. 4,449,289, which is a continuation of Ser. No. 173,052, Jul. 28, 1980, abandoned. This application Dec. 19, 1983, Ser. No. 562,528

Int. Cl.[4] H02K *15/10*

U.S. Cl. 29—734 **1 Claim**



1. An automatic system for placing phase insulators on a dynamoelectric machine assembly comprising a slotted core having a bore therethrough and winding turns accommodated thereby, the apparatus comprising:

a phase insulator work station that includes a rotatable insulator insertion arbor means for inserting phase insulators into the stator at one of a plurality of different preselectable angular orientations; a rotatable index switch plate attached to the arbor and having a plurality of index stop means angularly spaced about the switch plate for interacting with sensor means; a plurality of sensor means angularly spaced and positioned about the switch plate, the angular spacing of the sensor means being different from the angular spacing of the index stop means by an amount equal to the difference in the preselectable angular orientations of the phase insulators in the stator; and means for selecting the desired sensor means corresponding to the selected angular orientation of the phase insulators so that the insertion arbor is selectively positioned at the selected angular position for insertion of the phase insulators.

4,557,043

COMPONENT LEAD PROCESSING APPARATUS

Wojciech Starski, Lexington, Ky., assignor to RCA Corporation, Princeton, N.J.

Filed Dec. 5, 1983, Ser. No. 558,367

Int. Cl.[4] B23P *21/00*

U.S. Cl. 29—741 **15 Claims**

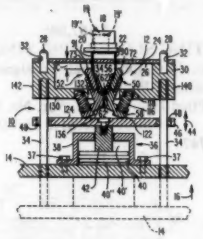
1. A component lead processing apparatus comprising:

support means for supporting and aligning a printed circuit board relative thereto;

lead bending means coupled and aligned relative to the support means for bending a lead of a component borne by the aligned printed circuit board to secure the component to the board, said lead bending means including lead contact means for electrically engaging and bending said lead; and

test means coupled to said lead contact means for indicating at least the electrical engagement of the lead contact means to said lead prior to the bending of that lead;

said lead bending means comprising a support member, a pair of metal bodies pivotally secured to the support member, dielectric means secured to the bodies, and at least two metal bending heads secured to said dielectric means, said dielectric means being sufficiently hard and durable to transfer the bending forces induced by said bending substantially to said bodies from said bending heads.



4,557,044

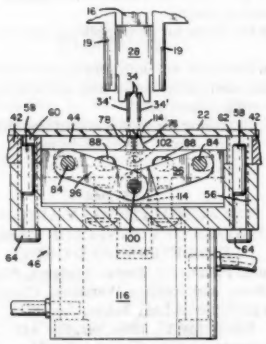
ELECTRICAL CONNECTOR CLINCHING MEANS

Stanley W. T. Crowman, Dillsburg; Bryan J. Dornes, Hershey; Edward J. Paukovits, Jr., Hummelstown; Richard V. Spong, Etters, and Robert J. Talarico, Camp Hill, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Feb. 26, 1985, Ser. No. 705,598

Int. Cl.[4] H05K *3/30*

U.S. Cl. 29—741 **10 Claims**



1. A clinching device for provisionally securing to a circuit board, electrical connectors which have been placed on one side of the board and each of which has rows of connecting posts extending through holes in the board so that a portion of each post projects from the other side of the board, the assembly comprising:

a plate for supporting the circuit board in a horizontal plane;

a plurality of openings formed in the plate each for receiving the post portions of one of the connectors;

a post-clinching unit mounted in each opening for clinching pairs of adjacent ones of the post portions towards said other side of the board;

pairs of slides provided in each post-clinching unit, each slide having a post-clinching ear projecting towards said plane, the slides of each pair being movable towards and away from one another between a post portion receiving, first position and a clinching, second position;

links connecting the slides of each pair and being connected

to a main pin which is movable between first and second positions to displace the slides of said pair between their first and their second positions; and

drive means connected to said unit and to said main pin to move it between its first and second positions.

4,557,045

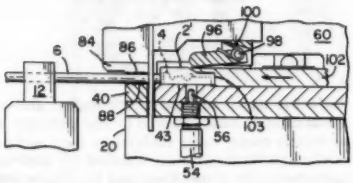
INSULATING SLEEVE APPLYING APPARATUS

Pedro Serrano, Barcelona, Spain, assignor to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 4, 1984, Ser. No. 677,784

Int. Cl.⁴ H01R *43/00*

U.S. Cl. 29—747 **11 Claims**



1. Apparatus for applying an insulating sleeve to an electrical terminal connected to an end of a wire lead, the apparatus comprising:

a frame;

means on the frame for locating the terminal in a given position;

means on the frame for capturing the wire lead proximate to the terminal and for then positioning the terminal in the locating means;

means on the frame for releasably retaining the terminal in the locating means;

means on the frame for then applying the sleeve to the terminal;

means on the frame for withdrawing the lead capturing and terminal positioning means and the retaining means from the locating means; and

means on the frame for then ejecting the terminal, with the sleeve thereon , from the locating means.

4,557,046

SYSTEM FOR AUTOMATICALLY ARRANGING ENDS OF WIRES OF CONNECTOR CABLE IN PREDETERMINED ORDER

Fumio Suzuki, Funabashi; Toshio Ohnuma, Narita; Kazuyuki Koga, Sakura, and Tatsuya Watanabe, Chiba, all of Japan, assignors to Fujikura Ltd., Tokyo, Japan

Filed May 17, 1984, Ser. No. 611,222

Claims priority, application Japan, May 20, 1983, 58-75795[U]; May 20, 1983, 58-75797[U]

Int. Cl.⁴ B23P *19/00*

U.S. Cl. 29—749 **4 Claims**

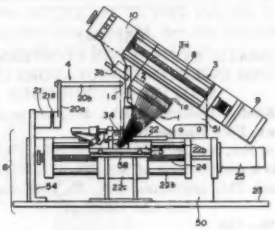
1. A system for automatically arranging ends of wires of a connector cable in a predetermined order which comprises:

(a) a wire holder for holding one ends of the wires;

(b) a wire feed means operable to feed the wire ends one by one from said wire holder;

(c) a transport meahs operable to transport each wire end from said wire feed means;

(d) an arranging means including (i) a fixture mounted on a base and having a plurality of parallel receptive sections arranged in a preselected manner and disposed in a common plane, (ii) a table mounted on the base adjacent to said fixture and having a slit formed therethrough and extending parallel to said receptive sections, said table being movable in a direction perpendicular to said receptive sections in parallel relation to said common plane, each wire end being moved on to said table by said transport means, (iii) a probe means operable to make electrical contact with the wire end to feed a probe signal, (iv) a first drive means operable to move said table, (v) a second drive means operable to bring the wire end into alignment with said slit, and (vi) a third drive means operable to urge the wire end, disposed in alignment with said slit, into a selected one of said receptive sections through said slit; and



(e) a control means to which the other ends of the wires are electrically connected, said control means being responsive to said probe signal to operate said first drive means to move said table, thereby bringing said slit of said table into alignment with the selected receptive sections of said fixture corresponding to the probed wire end, said control means being responsive to said probe signal to operate said second and third drive means to bring the wire end into alignment with said slit and to urge the wire end into the selected receptive sections through said slit.

4,557,047

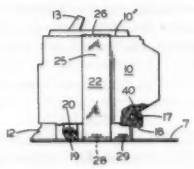
RETAINER FOR MOLDED CASE CIRCUIT BREAKERS

Andre J. M'Sadoques, and Robert J. Sabatella, both of Southington, Conn., assignors to General Electric Company, New York, N.Y.

Filed Apr. 19, 1982, Ser. No. 369,672

Int. Cl.⁴ H01H *9/02*; H01R *13/54*

U.S. Cl. 29—854 **5 Claims**



4. A method of retaining a molded case circuit breaker within an electrical panel box comprising the steps of:

fastening a U-shaped retainer clip within an electrical panel box by attaching at least one fastener through a bight portion on said retainer clip to said box; and

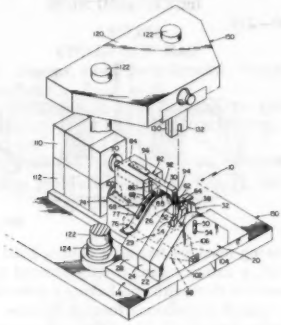
inserting a molded case circuit breaker having opposing edges formed on a top surface within a pair of upstanding sidearms on said retainer clip and overlapping a portion of said circuit breaker opposing edges with edges formed on said sidearms.

4,557,048

TOOL FOR ASSEMBLING INSULATED CONNECTOR

August V. Cordeiro, East Greenwich, R.I., assignor to Electric Terminal Corporation, Warwick, R.I.

Filed Jul. 11, 1983, Ser. No. 512,650
Int. Cl.[4] H01R *43/04;* B23P *19/02*
U.S. Cl. 29—863 10 Claims



1. A method of assembling an electrical terminal comprising:
positioning the parts of the terminal to be assembled in a work station;
inserting a wire to be crimped to a metal portion of the terminal into said work station;
securing the wire in place when it is properly positioned in said work station,
crimping the wire to the metal portion of the terminal by forcing a roll tool over the metal portion and the wire,
sliding an insulation box over the metal portion by means of a slide which reciprocates through said work station, and
releasing the wire and the assembled terminal.

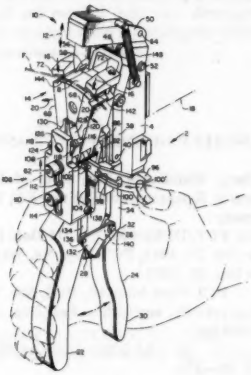
4,557,049

HAND HELD FIBER OPTIC CLEAVING TOOL

Doyle E. Cribbs, Titusville, and James R. Weckerly, Kennerdell, both of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Continuation of Ser. No. 368,853, Apr. 15, 1982, abandoned. This application Jul. 30, 1984, Ser. No. 634,672
Int. Cl.[4] B26B *13/26;* B65H *23/00*
U.S. Cl. 30—124 11 Claims

1. A hand-held tool for cleaving optical fibers, the tool comprising:
an elongated body having a longitudinal axis extending lengthwise thereof,
a fiber support surface attached to said body and extending in a plane transverse to said longitudinal axis,
cutting means attached to said body and moveable in the general direction of said longitudinal axis towards said fiber support surface for severing an optical fiber extending across said fiber support surface,
clamping means pivotally attached to said body for clamping said optical fiber and for pivotal movement about an axis transverse to said longitudinal axis for holding said optical fiber under tension,
a handle extending from said body,
at least one elongated first lever pivotally attached to said body for pivotal movement relative to said body and said handle and spring biased relative to said handle,
at least one elongated second lever one end of which is pivotally attached to said first lever, the other end of said second lever including a camming surface, said second lever also being pivotally attached to said body at a position along said second lever between said ends
wherein pivotal movement of said elongated first lever is effective to cause the application of tensile force along an



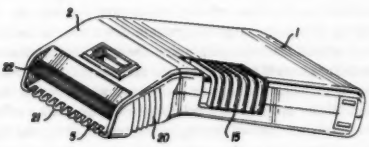
axial direction of an optical fiber and wherein pivotal movement of said elongated first lever beyond movement effective to cause the application of tensile force to an optical fiber is effective to cause movement of the cutting means in the general direction of said longitudinal axis toward said fiber support surface so as to sever an optical fiber extending across said support surface.

4,557,050

HAIR CUTTER

Hideaki Haraguchi, and Shunichi Hata, both of Shiga, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Dec. 3, 1982, Ser. No. 446,690
Claims priority, application Japan, Dec. 15, 1981, 56-202656
Int. Cl.[4] B26B *19/00*
U.S. Cl. 30—195 19 Claims



1. A hair cutter comprising:
a stationary blade having a leading edge with comb-like cutting teeth with recesses for hair thinning;
a movable blade in parallel contacting relationship to said stationary blade and having comb-like cutting teeth at its leading edge to define a cutting plane;
an elongated comb member disposed substantially parallel to and on one side of said cutting plane;
an elongated hair pressing member disposed substantially parallel to and on the other side of said cutting plane so that the leading edges of said stationary blade and said movable blade are located between said hair pressing member and said comb member; the comb-like cutting teeth of said stationary blade having cutting recesses in small and large depths at its leading edge and means
(a) to move said movable blade backward and foward along

said cutting plane in relation to said stationary blade to place the movable blade in operative cutting position in relation to either all of the cutting recesses of said stationary blade or only those recesses having large depth; and to

(b) move at least one of said comb member and said hair pressing member toward and away from a second plane generally perpendicular to said cutting plane.

4,557,051

MANUALLY GUIDED POWER ASSISTED CUTTING MACHINE

Rolf Jung, Waiblingen, Fed. Rep. of Germany, assignor to Krauss u. Reichert GmbH & Co. KG, Fellbach, Fed. Rep. of Germany

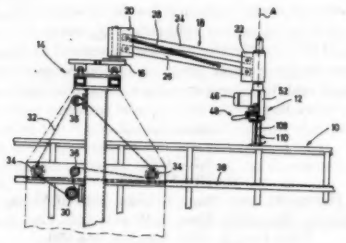
PCT No. PCT/DE83/00043, § 371 Date Oct. 27, 1983, § 102(e) Date Oct. 27, 1983, PCT Pub. No. WO83/03219, PCT Pub. Date Sep. 29, 1983

PCT Filed Mar. 10, 1983, Ser. No. 545,902

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1982, 3208746

Int. Cl.⁴ B26D *5/10*; A41H *43/00*

U.S. Cl. 30—273 **15 Claims**



1. A machine for cutting out flat material, in particular a fabric cutting machine, comprising a table for bearing the flat material, a supporting structure movable along the bearing table and supporting a cutting tool, in particular a cutter blade mechanism, rotatable about an axis extending perpendicular to the bearing surface of the table, and having an associated cutting tool drive, and comprising drive means consisting of a longitudinal drive for displacing the supporting structure along the table as well as at least one additional, controllable drive associated with the supporting structure for controlling movement of the cutting tool relative to the bearing surface of the table in a direction of cutting predetermined by the orientation of a cutting edge of the cutting tool, characterized in that a first angular position detector (87) is associated with the cutting tool (12), that with the aid of said first angular position detector directional control signals corresponding to the angular position of the cutting tool (12) relative to its axis of rotation (A) are generated, that a guide handle (48) is provided on the cutting tool (12) for rotating the cutting tool (12) by hand into the desired angular position relative to its axis of rotation (A), that signal generating means are associated with the guide handle (48), with which at least one control signal is generated when the handle is acted upon and said control signal serves as a start signal for the drive means (30, 40), and that a control (FIGS. 4 to 7) is provided, with which drive control signals are generated for the drive means (30, 40) to drive the cutting tool (12) in the direction of cutting as a function of the directional control signals from the first angular position detector (87) and said at least one control signal from the signal generating means (78, 86) associated with the guide handle (48).

4,557,052

MOWING MACHINE WITH ANNULAR INERTIA SHIFTER

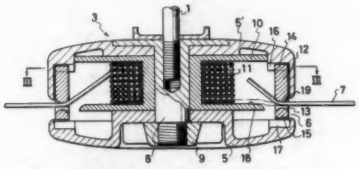
Toru Baba, Yokosuka, and Yasuo Saito, Fujisawa, both of Japan, assignors to Kioritz Corporation, Tokyo, Japan

Filed Feb. 7, 1984, Ser. No. 577,709

Claims priority, application Japan, Feb. 8, 1983, 58-16219

Int. Cl.⁴ A01D *50/00*

U.S. Cl. 30—276 **6 Claims**



1. A mowing machine having a cutting head comprising a driving shaft, a casing means fixedly secured to the driving shaft for rotation therewith and having a plurality of circumferentially spaced projections formed thereon, at least one flexible cutting line in the form of a coil wound on a spool housed in and removably fixed to the casing means and having a free end portion, an annular inertia shifter disposed in the casing means in a relation surrounding the coil and the spool at its radial outward position for vertical and angular movements relative to the casing means and having a plurality of circumferentially spaced projections formed thereon and adapted to engage said projections on the casing means during the mowing operation of the machine, said inertia shifter being provided with at least one opening through which said free end portion of the cutting line extended radially outwardly.

4,557,053

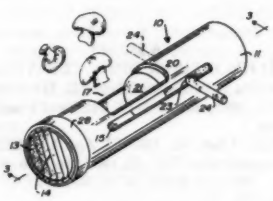
MUSHROOM SLICER

Donald Hadley, Jr., 7671 Derby La., Cotati, Calif. 94928

Filed Jul. 3, 1984, Ser. No. 627,412

Int. Cl.⁴ B26B *3/00*

U.S. Cl. 30—279 R **11 Claims**



1. A self-contained, freely movable, easily cleanable mushroom slicer, comprising

an open-ended cylindrical tube having at least one lengthwise slot therethrough,

a rectangular inlet opening parallel to and spaced from said slot for inserting mushrooms into said slicer, said tube then retaining it in place,

cutting means at one open end of said tube comprising a series of parallel wire passes across said tube, adjacent said end, the other end of said tube being fully open,

a cylindrical piston inside said cylindrical tube and freely movable inside it, having a radially extending opening leading thereinto from its peripheral surface, and

an easily detachable handle fitting in said radially extending opening and extending out from said piston through said slot,

whereby a mushroom can be placed in said tube between said piston and said cutting means and said piston rapidly moved manually by its said handle toward said cutting

means to propel said mushroom through said cutting means, and

whereby said handle can be detached and then said piston withdrawn completely through the fully open end and said handle, piston and tube then being easily cleanable without impediments or catching surfaces except said fully accessible cutting wires.

4,557,054

CHAIN SAW BAR

Cornelis J. M. Beerens, 40-42 Berkshire Rd., North Sunshine, Victoria, Australia

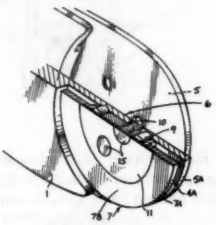
PCT No. PCT/AU83/00021, § 371 Date Oct. 13, 1983, § 102(e) Date Oct. 13, 1983, PCT Pub. No. WO83/02916, PCT Pub. Date Sep. 1, 1983

PCT Filed Feb. 16, 1983, Ser. No. 552,058

Claims priority, application Australia, Feb. 17, 1982, 2746/82

Int. Cl.⁴ B27B *17/02*

U.S. Cl. 30—384 **17 Claims**



10. A chain saw bar having top and bottom longitudinal edge faces along which a chain travels and a central longitudinal groove in said edge faces having opposite side walls to receive drive tongues of the chain, wherein at the forward end of the bar an extension of the bar of less thickness than the bar and having one side face coplanar with a side wall of the groove in the bar, so that a roller may be supported for rotation by a bearing structure mounted on said extension, said roller when so supported providing with the extension an arcuate surface to guide an inner edge of the chain from the top to the bottom edge face of the bar and defining a groove having opposite side walls co-planar with the opposite side walls of the central longitudinal groove to receive the chain drive tongues.

4,557,055

RAINBOW PROJECTOR

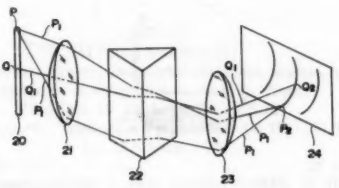
Akira Arai, Tokyo, Japan, assignor to Nihon Ouyou Kougaku Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 24, 1984, Ser. No. 633,918

Claims priority, application Japan, Jul. 29, 1983, 58-118491[U]

Int. Cl.⁴ G03B *21/28*

U.S. Cl. 353—81 **3 Claims**



1. A rainbow image projector adapted for projection of an arched rainbow image onto a wall or like comprising a linear incadescent light source, a cylindrical condenser lens extending in parallel to said linear light source and adapted to receive light rays diverging from said linear light source in a fan-shape and to convert these light rays into parallel light rays similarly divergent in a fanshape, said cylindrical condenser lens being at least twice as long as said linear light source, and a triangular prism extending in parallel to said cylindrical condenser lens and adapted to receive said parallel light rays coming from said condenser lens so that sad parallel light rays divergent in a fan-shape are obliquely incident upon the triangular prism over whole area of its first refraction plane.

4,557,056

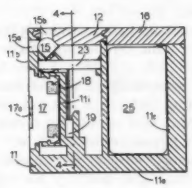
ELECTRONIC ANGLE INDICATOR

Sun Kim, and Bonjue Kim, both of Valley Rd., Wayne, N.J. 07470

Filed Jun. 29, 1983, Ser. No. 509,155

Int. Cl.⁴ G01C *9/06*

U.S. Cl. 33—366 **4 Claims**



1. An angle indicator comprising:

a case having a contacting surface;

a case tilt response means having a disc, which has a pivot through the center of the disc and a properly unbalanced center of mass for always seeking for the center of gravity field and for damping possible oscillation, pivotally mounted in said case and retaining at least one magnet source therein to provide a case tilt information in terms of magnetic field intensity; utilizing a magnetic field sense means to properly sense the magnetic field intensity of said case tilt response means and producing an electrical signal proportional to the magnetic field intensity;

a desired case orientation selection means mounted on said case to be able to change positions for desired case orientations and retaining at least one magnet source to provide a desired case orientation reference in terms of magnetic field intensity;

utilizing a magnetic field sense means mounted in said case at a distance to properly sense the magnetic field intensity of said desired case orientation selection means and producing an electrical reference signal proportional to the magnetic field intensity;

a correct angle attainment decision means with respect to said desired case orientation reference having an upper and a lower limit decision making circuit; and

display means mounted on said case for displaying a first indicator for a lesser angle, a second indicator for a greater angle and the both indicators for a correct angle attainment with respect to a desired case orientation selection.

4,557,057
APPARATUS FOR THE DRYING OF TOBACCO MATERIALS

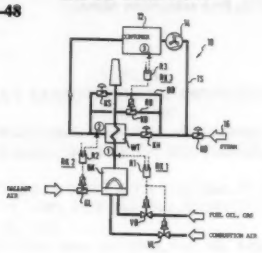
Arno Weiss, Delingsdorf, and Horst Gaisser, Hassloch, both of Fed. Rep. of Germany, assignors to B.A.T. Cigaretten-Fabriken GmbH, Hamburg, Fed. Rep. of Germany

Filed Feb. 7, 1984, Ser. No. 577,930

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1983, 3305670

Int. Cl.[4] F26B *17/10*

U.S. Cl. 34—48 **15 Claims**



1. An apparatus for the drying of tobacco materials comprising:

(a) an endless conveying system for circulating a mixture of hot gas and steam;

(b) a consumer apparatus in said conveying system which includes

(1) means for feeding and entraining tobacco materials to be dried into the circulating mixture of hot gas and steam, and

(2) means for separating the dried tobacco materials from the circulating mixture of hot gas and steam;

(c) a heat source in said conveying system,

(d) a first control bypass connected to said conveying system bypassing around said heat source and having means for adjusting throughflow quantity for regulating temperature of the circulating mixture of hot gas and steam;

(e) means for feeding steam to said conveying system including a first shutoff element;

(f) a second, ready-use, full-flow bypass connected to said conveying system around said heat source in parallel to said first control bypass;

(g) a second shutoff element positioned in said conveying system between said heat source and said first and second bypasses;

(h) a third shutoff element positioned in said second bypass; and

(i) means operatively connected to said second and third shutoff elements for controlling flow of the circulating mixture of hot gas and steam such that the mixture either substantially completely flows through said heat source or substantially completely flows through said second bypass bypassing said heat source.

4,557,058
DRUM TYPE LAUNDRY DRYER

Toru Ozawa, and Hiroshi Kinoshita, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

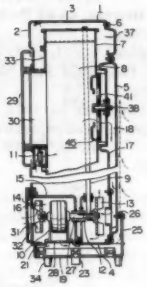
Filed May 22, 1984, Ser. No. 612,808

Claims priority, application Japan, May 23, 1983, 58-89142

Int. Cl.[4] F26B *11/04*

U.S. Cl. 34—82 **8 Claims**

1. A drum type laundry dryer including an outer frame, a drying drum rotatably supported by said outer frame and adapted to receive laundry to be dried, means for introducing air into said drying drum, means for heating the air to be introduced into said drying drum, an air outlet provided in said drying drum, and lint collecting means provided adjacent to said air outlet, wherein said lint collecting means comprises filter means for capturing lint separated from laundry being dried in said drying drum, means for establishing different filter areas on said filter means and a lint collector for receiving lint captured by said filter means, said filter means including a net-like filter section including a radially inner filter area adapted to be exposed to the laundry in said drying drum, said establishing means being disposed in closely spaced, opposed relationship to the portion of said net-like filter section radially



outward of said radially inner filter area and operating to assure that, during operation of the laundry dryer, said portion of said net-like filter section has a radially outer area adapted not to be contacted by the laundry being dried and an intermediate filter area disposed between said radially inner and outer filter areas and adapted to be contacted by wet laundry being dried but not contacted by the laundry when the laundry has been substantially dried in said drying drum.

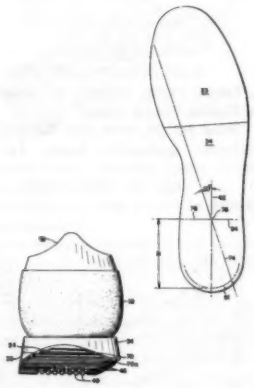
4,557,059
ATHLETIC RUNNING SHOE

Kenneth W. Misevich, Fairfield, Conn., and John L. A. Wilson, Brookline, Mass., assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Feb. 8, 1983, Ser. No. 465,023

Int. Cl.[4] A43B *5/00, 13/04, 13/12*

U.S. Cl. 36—32 R **13 Claims**



1. In an athletic running shoe, a sole structure having a ground-engaging bottom which is contoured along a portion of the lateral border of the bottom to provide an arcuate landing surface for runners who make first foot strike along a portion of the lateral border, said arcuate surface curving

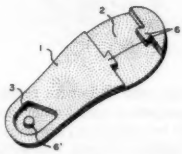
smoothly upwardly and away from the ground in the direction of the lateral edge of the sole structure and extending to the lateral edge of said sole structure and being radiused about a preselected oblique axis which crosses the rearquarter centerline of said shoe, said centerline bisecting the rearquarter of said sole structure.

4,557,060

INSOLE WITH EXCHANGEABLE RELIANT PIECES

Yukio Kawashima, Akashi, Japan, assignor to Mizuno Corporation, Osaka, Japan

Filed Jun. 24, 1983, Ser. No. 507,452
Claims priority, application Japan, Jun. 26, 1982, 57-96410
Int. Cl.[4] A43B *13/38*
U.S. Cl. 36—44 **4 Claims**



1. An insole for a shoe, said insole comprising:

a body made of one of thermoplastic and thermosetting foam synthetic resin, said body including a heel area and a forefoot area having a top surface and a bottom surface,

two recesses defined by said body located on one of the top surface and the bottom surface of said body, one of said two recesses being located at said heel area of said body and being spaced from the sides of said body, the other of said two recesses being located at a forefoot area of said body and extending laterally to opposed side edges of said body,

two reslient members having a different durometer hardness than that of said body, said two resilient members being complementary in shape to said two recesses for frictionally engaging said two recesses, and

said body includes a projection spaced from the peripheral edge of said one of said two recesses and projecting into said one recess, the resilient member complementary in shape to said one of said two recesses defines a hole frictionally engaging said projection, said body also includes two wedges, each wedge extending from opposed lateral edges of said other of said two recesses and the resilient member complementary in shape to said other of said two recesses defining two notches frictionally engaging said two wedges.

4,557,061

ALPINE SKI BOOT

Gerard Graillat, Annecy, and Michel Mabboux, Seynod, both of France, assignors to Salomon S.A., Annecy, France

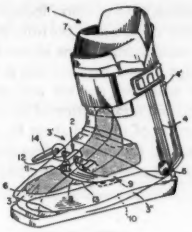
Filed Oct. 19, 1982, Ser. No. 435,287
Claims priority, application France, Oct. 19, 1981, 81 19997
Int. Cl.[4] A43B *5/04*
U.S. Cl. 36—119 **28 Claims**

1. A boot comprising:

(a) a shell base having an inner sole mounted therein;

(b) a foot retention system positioned within said shell base, said foot retention system comprising at least one support element positioned between said shell base and the area in which a foot is to be inserted, said support element being adapted to at least partially cover said foot; and

(c) an adjustable tightening apparatus for tightening said support element around said foot, said tightening apparatus comprising pressurization means for pressing said support element against the foot and adjustment means for



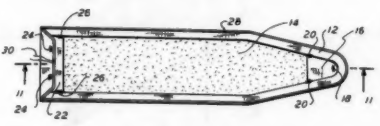
adjusting said pressurization means wherein said pressurization means comprises means for simultaneously pressing said foot against said inner sole and one lateral side of said boot, whereby said pressurization means exerts pressure on a front portion of the foot, said pressurization means extending generally from the inner sole of said boot to the upper portion of the foot.

4,557,062

FORM FITTING IRONING BOARD COVER

Henry Mattesky, Cedar Grove, N.J., assignor to Magla Products, Irvington, N.J.

Filed Jun. 7, 1985, Ser. No. 742,181
Int. Cl.[4] D06F *83/00*
U.S. Cl. 38—140 **10 Claims**



1. A form-fitting cover for use on an ironing board comprising

a substantially non-elastic fabric ironing surface sheet,

a stretchable, substantially heat resistant pad sheet disposed below said surface sheet,

said surface sheet being dimensioned to be larger than a standard ironing board so that when fitted to such a board it will fit over the upper surface thereof around its edges and just around the perimeter of its lower surface,

the pad sheet having a breadth dimension substantially equal to that of the breadth dimensions of the board but having a length dimension between 0.5% and 10% less than that of the board,

a nose portion, enveloping a minor forward arcuate segment of said pad sheet, said nose portion being rigidly affixed to said pad sheet around a portion of the periphery of the curved edge of said arc and additionally being affixed to said surface sheet at at least one position proximate to the periphery of the curved edge of said arc,

said peripheral attachment of the forward and rearward arcuate segments of said pad sheet to said nose portion and to said heel portion and the location of the said attachment of said nose portion to said surface sheet respectively being the only sectors of attachment of said pad to the other components of said cover,

forward reinforcing means located forwardly of the rearward edge of said nose portion at the common peripheral edge of said nose portion and said pad sheet,

a heel portion, having a rearward segment, said segment enveloping a minor rearward arcuate segment of said pad sheet, said heel portion being rigidly affixed to said pad sheet around a portion of the periphery of the curved edge of said arc,

the upper face of said heel portion being affixed to the lower face of said surface sheet at at least one position on said heel portion, said position located forwardly of the rearward edge of said heel portion, and

rearward reinforcing means located rearwardly of the forward edge of said heel portion at the common peripheral edge of said heel portion and said pad sheet, whereby when the said nose portion of the board is inserted into the nose portion of the pad sheet by rearward pulling of the heel portion, the same is slippable over the heel of the board giving a snug fit of the pad sheet thereon.

4,557,063

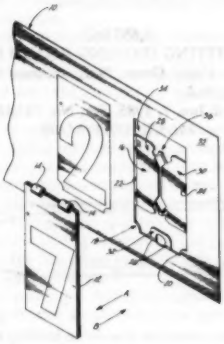
PRESSED NUMBER POCKET

Daniel H. Bloom, 24601 Priscilla Dr., Dana Point, Calif. 92629

Filed Apr. 23, 1984, Ser. No. 603,073

Int. Cl.[4] G09F *3/20*

U.S. Cl. 40—5 **14 Claims**



1. A sign holder for a packet of planar members bearing characters for display comprising:

deformable material having a sheet portion comprising a pocket for receipt of the packet, the pocket comprising a front retaining wall formed from the sheet portion to prevent the packet from moving out of the pocket in a front direction, the pocket further comprising, pressed from the sheet portion in a direction away from the front direction,

first and second opposed and spaced apart side walls,

a third side wall located in the pocket intermediate the first and second side walls, the first, second and third side walls retaining the packet in directions transverse to the front direction,

first, second and third backing walls, connected respectively to the first, second and third side walls, the first, second and third backing walls inhibiting movement of the packet in a direction opposite to the front direction,

the pressed sheet of material comprising at least one gap for substantially separating the first, second and third backing walls from each other, and

at least one bridge in the at least one gap extending between and providing rigidity to the first and second backing walls.

4,557,064

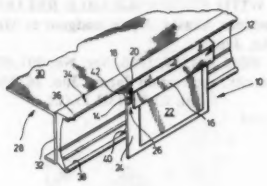
FEATURED PRICE CARD HOLDER

James O. Thompson, 50 Graydon Hall Dr., Apt. 1109, Don Mills Ontario M3A 3A4, Canada

Continuation of Ser. No. 498,540, May 26, 1983, abandoned. This application Oct. 16, 1984, Ser. No. 662,791

Int. Cl.[4] G09F *3/18*

U.S. Cl. 40—10 R **1 Claim**



1. A plastic display card holder for receiving and gripping a card for display purposes, said holder comprising interconnected spaced-apart extruded wall portions of a relatively rigid plastic, said wall portions being connected in a manner to provide an entrance therebetween for a display card, a plurality of soft flexible resilient plastic fins integral with and coextruded on each of said wall portions and extending the length of each wall portion to provide a plurality of opposing fins, said plastic fins being of a soft plasticized plastic which has a durometer rating in the range of 55 to 95, said soft plasticized plastic bonding to said rigid plastic when coextruded onto said rigid plastic, said opposing fins being offset laterally of each other relative to said entrance, said fins on each said wall portion extend into the space between the wall portions greater than one-half the distance between said wall portions whereby said opposing fins overlap one another, said fins as they extend into said space between the wall portions are directed generally away from the entrance of the holder in the direction of insertion of a display card, the arrangement being such that as a display card is inserted in the holder, the fins flex away from said entrance to receive readily such inserted display card, such flexed fins of said soft plastic frictionally engaging such inserted display card and increase the grip on such display card as it is withdrawn by virtue of the fins being flexed in a direction opposite said direction in which they normally extend, said fins in flexing in said opposite direction releasing such card being withdrawn without damaging such card.

4,557,065

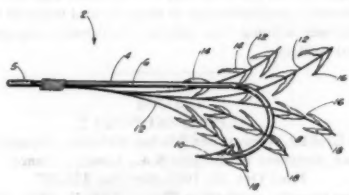
FISH HOOK AND LURE

Phillip H. Rye, 1701 Jefferson Ave., New Orleans, La. 70115

Filed Jan. 6, 1984, Ser. No. 568,783

Int. Cl.[4] A01K *83/06*

U.S. Cl. 43—43.16 **5 Claims**



1. An improved fish hook or lure for catching fish, comprising:

a. a hook means, comprising a shaft extending in a first direction, curving in a bight to a point extending opposite to the first direction;

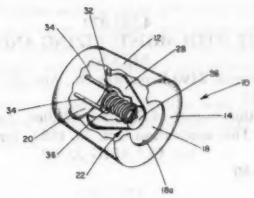
b. a plurality of elongated flexible reversed serrated fila-

ments attached to the shaft of the hook extending beyond the extension of the bight of the hook each filament having a plurality of reversed oppositely disposed barbs.

4,557,066
ANIMAL TRAP

Oliver W. Godwin, Jr., 205 Lakeshore Dr., Dunn, N.C. 28334

Filed May 21, 1984, Ser. No. 612,259
Int. Cl.[4] A01M *23/02*
U.S. Cl. 43—60 **10 Claims**



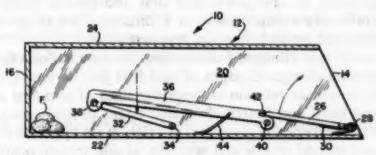
1. A disposable tomb type rat and mouse trap for trapping a rat or mouse and suffocating the same, comprising: a container structure including an imperforated wall structure having surrounding sides, a back, and a circular access opening formed therein, said container forming and defining an interior compartment therein; a conical shaped door having a major axis, a base, and a door closing end portion opposite said base, said conical door normally assuming an open position and disposed within the interior compartment of said container and in said open position said door closing end portion assumes a spaced apart relationship with said circular access opening so as to allow a rat or mouse to enter said container via said access opening; a bait area formed within said container between the back thereof and the base of said conical shaped door; a spring seat disposed within said tomb type container and laterally spaced from the base of said conical shaped door; spring means operatively connected between said spring seat and a bottom surface of said conical shaped door for spring biasing said conical shaped door toward said access opening; a pair of ears projecting outwardly from said conical shaped door; a pair of retainers extending inwardly from the wall structure of said container and projecting into the interior compartment of said container and normally engaging said pair of ears for restraining said conical shaped door and holding the same in said open position against the force of said spring; and wherein said conical shaped door is positioned within said container so as to lie in the path of a rat or mouse when the same moves from said access opening toward said bait area such that as the rat or mouse moves toward the bait area the rat or mouse will engage said conical shaped door and move the same such that said pair of ears projecting therefrom will no longer be restrained by said pair of retainers thereby causing said spring means to project said conical shaped door toward said access opening such that the door closing end portion of said conical shaped door projects through said access opening and closes the same so as to trap and contain, the rat or mouse within said container.

4,557,067
ANIMAL TRAP

Heung Y. Ha, 5219 Juliet St., Springfield, Va. 22151

Filed Feb. 19, 1985, Ser. No. 702,585
Int. Cl.[4] A01M *23/18*
U.S. Cl. 43—61 **5 Claims**

1. An animal trap, comprising:
an elongated housing having an open end and a closed end;
a door pivotally mounted at its lower end on said housing adjacent said open end and movable between an upright closed position wherein it closes said open end and an open position wherein it is disposed within said housing in a substantially laterally extending position near the bottom of said housing;
means for biasing said door to said closed position;
a panel pivotally connected at one end to the housing and extending generally laterally within said housing near the bottom thereof toward said closed end;
an elongated pawl member pivotally connected at one end with the adjacent end of the panel opposite to said one end thereof, said pawl member being pivotally connected at its

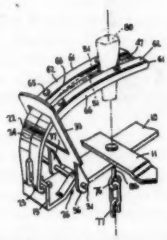


opposite end to said housing and having a tooth at said opposite end; and
means for urging said pawl member in an upward direction;
said tooth being positioned to engage said door when it is moved to said open position to retain said door in said open position, said tooth being movable to a position wherein it releases said door to enable said biasing means to move said door to said closed position when an animal enters said housing and steps on said panel to pivotally move it and said pawl member downwardly.

4,557,068
PADDED LEGHOLD TRAP

Gerald A. Thomas, and William E. Askins, both of Lititz, Pa., assignors to Woodstream Corporation, Lititz, Pa.

Filed Dec. 2, 1983, Ser. No. 557,322
Int. Cl.[4] H01M *23/26*
U.S. Cl. 43—90 **30 Claims**



1. In an animal trap of the type comprising a frame, first and second jaws having first and second jaw surfaces, respectively, and mounted adjacent one another on said frame for pivotable movement about first and second axes, respectively, and between set and sprung positions, said jaws in said set position defining a relatively wide angle therebetween with said first and second jaw surfaces spaced from one another, and in said sprung position defining an angle of substantially zero degrees therebetween with said first and second jaw surfaces abutting one another, acutator means for continuously and forcefully urging said jaws to said sprung position, setting means for defining said set position by holding said jaws in said set position against the urging of said actuator means, and actuable trigger means for releasing said setting means to permit said jaws to be snapped by said actuator means to said sprung position under the urging of said spring means, an improvement comprising:
first and second recesses defined in said first and second jaw

surfaces, respectively, to define a gap between elongated contacting portions of said first and second jaw surfaces in said sprung position of said jaws; and

padding means carried by each jaw for cushioning the impact of said jaws snapping together on a member trapped between the jaws, said padding means comprising a first pad disposed in said first recess between said first and second contacting portions and a second pad disposed in said second recess between said third and fourth contacting portions and opposite said first pad in said sprung position of said jaws, said first and second pads being resiliently compressable in a direction inwardly of said first and second recesses, respectively;

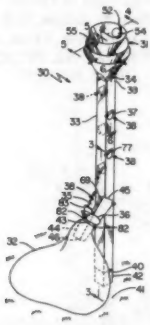
wherein said elongated contacting portions include first and second elongated edges of said first jaw surface disposed in co-planar relation on opposite sides of said first recess, and third and fourth elongated edges of said second jaw surface disposed in co-planar relation on opposite sides of said second recess, and wherein, in said sprung position of said jaws, said first and third edges contact one another to form a first elongated contact portion, and said second and fourth edges contact one another to form a second elongated contact portion co-planar with said first elongated contact portion.

4,557,069

INSECT TRAP ARRANGEMENT, KIT THEREFOR AND METHOD OF MAKING THE SAME

Edward N. Caldwell, Knoxville, Tenn., assignor to Dalen Products, Inc., Knoxville, Tenn.

Filed Dec. 14, 1983, Ser. No. 561,283
Int. Cl.[4] A01M *1/10*
U.S. Cl. 43—122 **4 Claims**



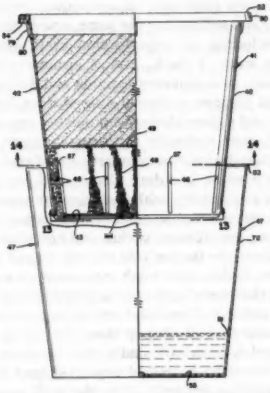
1. In an insect trap arrangement comprising a lure unit for attracting insects thereto and causing the attracted insects to fall by gravity therefrom, an insect storage container means having an inlet means for receiving the falling insects therethrough whereby said storage container means is adapted to store said falling insects therein, and a conveying means disposed intermediate said lure unit and said storage container means and having an inlet means operatively associated with said lure unit to receive said falling insects therefrom and having an outlet means operatively associated with said inlet means of said storage container means for discharging by gravity said falling insects from said conveying means into said inlet means of said storage container means, the improvement wherein said conveying means has means defining a plurality of spaced apart air break means between said lure unit and said inlet means of said storage container means to vent the rising odor of the insects in said storage container means to the atmosphere so that the vented odor will substantially dissipate in the atmosphere before reaching said lure unit, said storage container means being disposed on a supporting surface said conveying means having opposed ends one of which is disposed to be supported on said surface means and the other of which supports said lure unit thereon, said conveying means comprising a tubular member having spaced apart openings formed therein intermediate said opposed ends thereof and respectively defining at least some of said air break means, said outlet means of said conveying means comprising a chute means extending laterally outwardly from said tubular member intermediate said opposed ends thereof and having an outer end received in said inlet means of said storage container means.

4,557,070

PLANT POT WITH MOISTURIZING AND AERATION MEANS

George C. Oyama, 2190 Broadway St., Apt. 3E, San Francisco, Calif. 94115

Continuation-in-part of Ser. No. 401,066, Jul. 23, 1982, abandoned. This application Oct. 28, 1983, Ser. No. 546,490
Int. Cl.[4] A01G *25/00*
U.S. Cl. 47—80 **7 Claims**



1.Aa plant pot for holding a living plant and soil comprising:

a. an open topped inner plant container formed from an impermeable material having outwardly and upwardly extending sidewalls terminating in a top edge and formed with an outwardly extending flange disposed closer to the top of said inner plant container than the bottom of said inner plant container for containing said plant, non-soil, and soil and a right angularly related generally planar bottom wall formed with a plurality of openings generally distributed over substantially said entire bottom wall permitting the free passage of air and water, and said bottom wall having an area substantially as great as the area of said open top;

b. an outer container formed from an impermeable material and formed with a generally planar bottom wall and having outwardly and upstanding sidewalls terminating in a rim adjacent and below said annular flange for enveloping substantially the entire portion of said inner plant container and said sidewall is marked with a fill level mark for water;

c. air admissions means located adjacent said upper portion of said outer container permitting the continuous exchange of air to and from said lower portion of said inner plant container;

d. a quantity of non-soil water absorbing filler material filling said bottom portion of said inner plant container to a selected fill level and permitting the passage of air and water and generally supporting and preventing the passage of said soil material;

e. said volumes of said inner and outer containers are selected and said water fill level mark is selected so that the initial water supply will be absorbed by said non-soil filler material and upon adsorption, the level of said water will fall below the level of the bottom wall of the inner container;

f. said inner and outer sidewalls of said containers are substantially coterminus but spaced to provide space for the passage of air;

g. said sidewalls of said inner and outer containers are positioned at substantially the same angle with respect to their respective bottom walls so that said inner container will nest within said outer container, said inner container will nest within a plurality of said inner containers and said outer containers will nest within a plurality of said outer containers; and

h. elevating means raising said bottom wall of said inner container above the bottom wall of said outer container a selected distance.

4,557,071

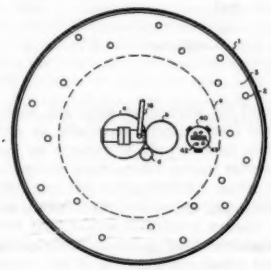
AUTOMATIC WATERING AND FEEDING SYSTEM FOR PLANTS

Ah N. Fah, 2349 Taman Labu Utama, Seremban N.S., Malaysia

Filed Jun. 6, 1984, Ser. No. 617,985

Int. Cl.[4] A01G *25/00*

U.S. Cl. 47—81 **3 Claims**



1. An automatic watering and feeding system for plants, in combination comprising:

a plant container having a soil medium disposed therein in an annular exterior ring,

a water reservoir container disposed centrally in the base of said plant container, also having a water storage annular ring disposed under aforesaid soil medium,

at least one wick partially extending down into said water reservoir container through a water reservoir cover having a wick aperture and said at least one wick partially extending up into said soil medium, said at least one wick mid portion being supported by said wick aperture, and said cover having water drainage apertures there through, and,

an automatic water supply means having a water filter operatively appended to a water inlet hose, said filter secured to a nozzle valve having a water aperture directed downwardly and said valve held firmly on an assembly platform disposed across an upright tubular water jacket, a needle upwardly secured at a lower needle end to a needle holder arm, the needle upper end oscillatingly secured to said nozzle valve aperture, said needle holder arm is pivotedly secured at a said arm first terminus to said water jacket wall and a first permanent magnet is secured to said needle holder arm upwardly adjacent to a second permanent magnet secured to said assembly platform by a second pivotally secured arm, said pair of magnets adaptively positioned to allow their magnetic field to closely pivotally interact, said needle holder arm and said second arm each having an arm aperture therein freely allowing each said arm to move vertically on a vertically disposed float arm which is secured at one float arm terminus to an assembly hollow water float floating over and on the water disposed in said water reservoir, a pair of opposed bottom and upper stops are adjustably affixed to said vertical float arm limiting the rise and fall of said water float, a cover on said water jacket positioning said water inlet hose, and a water discharge aperture disposed in said jacket side wall at said jacket bottom connecting said water reservoir to an adjacent automatic liquid fertilizer dispenser means,

aforesaid at least one wick and aforesaid water drainage apertures providing water to said soil medium by capillary action when said soil medium becomes dry.

4,557,072

DOOR ARRANGEMENT FOR THE CONTROL PANEL OF AN APPARATUS

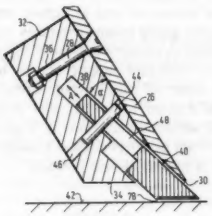
Hubert Rittmeister, Salzkotten-Thüle, and Karl-Heinz Seroka, Salzkotten, both of Fed. Rep. of Germany, assignors to Nixdorf Computer A.G., Fed. Rep. of Germany

Filed Mar. 6, 1984, Ser. No. 586,795

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1983, 3309462

Int. Cl.[4] E05F *15/02*

U.S. Cl. 49—27 **6 Claims**



1. Door arrangement for the control panel of an apparatus, particularly a money dispenser, including a door leaf which is movable by means of a door drive in its plane between an open position unblocking the control panel and a closed position covering the control panel, in which it lies at least approximately against a stop face by a closing edge with a direction transverse to the direction of motion, and a sensing device arranged on the door leaf and controlling the door drive with a sensing element which is movable between a first position protruding over the closing edge and a second position aligned with the closing edge, characterized in that the sensing element is formed by a contact strip (**40**) extending over the total length of the closing edge (**30**) which is guided movably on the inside of the door leaf at an acute angle α to the plane of the door leaf in such a way that in its first position it at least approximately touches or intersects the plane of the outer surface (**26**) of the door leaf.

4,557,073

REVOLVING DOORS

Kjell H. Sandling, Landskrona, Sweden, assignor to K. S. Konsult Kjell Sandling, Landskrona, Sweden

Filed Oct. 28, 1983, Ser. No. 546,613

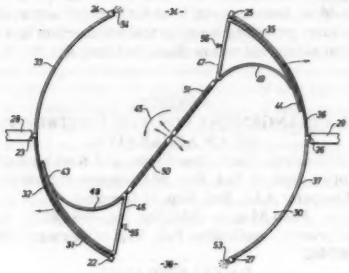
Claims priority, application Sweden, Nov. 5, 1982, 8206294

Int. Cl.[4] E06B *3/24*

U.S. Cl. 49—41 **25 Claims**

1. A revolving door comprising two spaced cylindrical wall sections disposed to at least partially enclose a generally cylindrical passage space having two diametrically opposed passage openings, revolving door means rotatable within said cylindrical passage space, said revolving door means comprising structure support means diametrically disposed on opposite sides of

the center of said cylindrical passage space, said revolving door means further comprising door elements pivotably mounted on said structure support means for pivotal movement between open and closed positions about axes spaced from the center of said cylindrical passage space, and turntable means for rotatably supporting said revolving door means for rotary movement within said cylindrical passage space between open and closed positions, said turntable means comprising cylindrical support guide means spaced from the center of



said cylindrical passage space and generally overlying the circular path of travel of said structure support means, said cylindrical support guide means rotatably engaging said structure support means to thereby rotatably support said revolving door means, said structure support means having outer panel sections which close off said passage openings when said revolving door is rotated to said closed position, said spaced cylindrical wall sections each having a pivotal door unit to provide egress from said cylindrical passage space when said revolving door is in said closed position.

4,557,074

METHOD AND APPARATUS FOR GRINDING UNDULATE CUTTING EDGES OF KNIVES IN TOBACCO CUTTING MACHINES

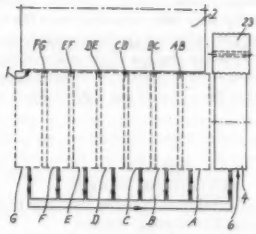
Uwe Elsner, Dassendorf, and Werner Komossa, Börnsen, both of Fed. Rep. of Germany, assignors to Hauni-Werke Körber & Co. KG, Hamburg, Fed. Rep. of Germany

Filed Jul. 13, 1984, Ser. No. 630,389

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1983, 3325751; Feb. 2, 1984, 3403543

Int. Cl.[4] B24B *7/00*

U.S. Cl. 51—5 D **25 Claims**



1. A method of grinding the elongated undulate cutting edge of a knife, which orbits along an endless path about a predetermined axis in a tobacco cutting machine, by means of a rotary grinding wheel which is movable relative to the orbiting knife and has a profile that is complementary to that of the cutting edge, comprising the steps of advancing the grinding wheel stepwise relative to the orbiting knife longitudinally of the cutting edge; and moving the profile of the grinding wheel into contact with different portions of the cutting edge between stepwise advances of the grinding wheel.

4,557,075

APPARATUS FOR SHAPING AN ELECTRODE OF A PRESCRIBE SPATIAL CONFIGURATION BY MEANS OF AN ABRADING DIE

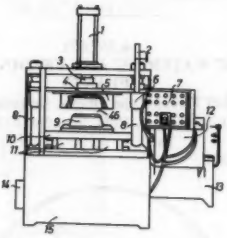
Werner Ullmann, Muralto; Max Bantle, Platz Walzenhausen, both of Switzerland; Harry Neumann, Ennepetal; Ulrich H. Seuser, Neuwied, both of Fed. Rep. of Germany, and Andre Mathys, Ennetbürgen, Switzerland, assignors to Werner Ullmann, Orselina, Switzerland

Filed Dec. 16, 1983, Ser. No. 562,108

Claims priority, application Switzerland, Dec. 21, 1982, 7432/82; Oct. 14, 1983, 5608/83

Int. Cl.[4] B24B *19/00*

U.S. Cl. 51—58 **41 Claims**



1. An apparatus for shaping an electrode workpiece to a prescribed spatial configuration, especially an abrading machine for shaping an electrode workpiece by means of an abrading die member having substantially the spatial configuration of the electrode workpiece but different dimensions to leave an abrading gap therebetween, wherein an abrading medium and a relative motion of a first kind between said abrading die member and the electrode workpiece generate or refine the desired spatial configuration of the electrode workpiece, said relative motion of a first kind comprising a composite motion composed of a feed motion and a planetary motion, and wherein there is provided a periodically retract and advance motion of a second kind between the abrading die member and the electrode workpiece to improve flushing conditions in said abrading gap, comprising:

means for the automatic selective adjustment of a degree of eccentricity of said planetary motion;

selectively releasable engagement means for automatically latching a selected degree of said eccentricity; and

means for automatically controlling and accomodating to the conditions prevailing in the abrading gap (i) an abrading pressure between the abrading die member and the electrode workpiece during said feed motion, (ii) the speed of the feed motion, and (iii) the speed of the periodical retract and advance motion of the second kind.

4,557,076

GRINDING MACHINE FOR THE RIMS OF SPECTACLE LENSES

Otto Helbrecht, In den Weiden 3, D-4010 Hilden, Fed. Rep. of Germany

Filed May 4, 1984, Ser. No. 606,955

Claims priority, application Fed. Rep. of Germany, May 6, 1983, 3316619

Int. Cl.[4] B24B *49/00*

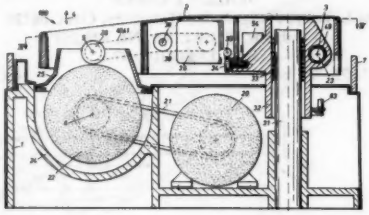
U.S. Cl. 51—165.71 **14 Claims**

1. A grinding machine for the rims of spectacle lenses, comprising:

a holder for a spectacle lens blank;

a grinding disk assembly;

a means for applying said lens blank to said grinding disk assembly and rotating said lens blank about a first axis parallel to an optical axis of said lens blank, wherein said means for applying and rotating include a pivoting arm for holding the lens holder and for pivoting about a second axis parallel to the first axis, a guide body connected to the pivoting arm, a straight line guide for slidably guiding the guide body along a third axis perpendicular to the first axis, a first variable stop for stopping the guide body on the straight line guide, a second stop for stopping the pivoting of the pivot arm when the arm is substantially horizontal; and



means for controlling said application of said lens blank to said grinding disk assembly according to a predetermined circumferential configuration of the spectacle lens, said control means comprising an electornic computer, fed by an electronic data memory, containing a set of data indicative of the desired circumferential configuration of said spectacle lens and wherein the controlling means also includes means for varying the position of said first stop, and wherein said second stop is operatively connected with the controlling means for stopping said arm in a substantially horizontal position.

4,557,077

OPTICAL PROJECTION PROFILE-GRINDING MACHINE

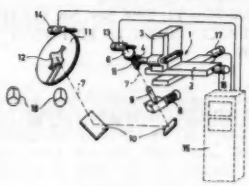
Alfred Kolb, Haus am Tannenberg, D-6980 Wertheim, Fed. Rep. of Germany

Continuation of Ser. No. 465,607, Feb. 10, 1983, abandoned. This application Jan. 14, 1985, Ser. No. 691,441

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1982, 3207107

Int. Cl.⁴ B24B *49/12*

U.S. Cl. 51—165.72 **4 Claims**



1. An optical projection profile-grinding machine comprising:

means for holding a workpiece to be machined,

means for rotating the workpiece and holding means about a first axis of rotation,

means for grinding the new workpiece wherein said grinding means is positionable in relation to the workpiece,

image projecting means including a projection screen wherein said projecting means displays an enlarged image of the point of engagement between said grinding means and the workpiece along an optical axis onto said projection screen, said first axis of rotation of the workpiece and holding means being coincident with said optical axis, and

means for rotating said projection screen and said holding means and workpiece in synchronism and at the same angular velocity around said first axis and said optical axis.

4,557,078

METHOD OF DRESSING AND FINISHING GRINDING WHEELS

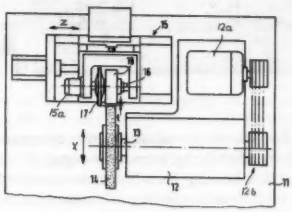
Jürgen Brill, Stuttgart, Fed. Rep. of Germany, assignor to Schaudt Maschinenbau GmbH, Stuttgart, Fed. Rep. of Germany

Filed Apr. 24, 1984, Ser. No. 603,459

Claims priority, application Fed. Rep. of Germany, Apr. 27, 1983, 3315196

Int. Cl.⁴ B24B *53/04*

U.S. Cl. 51—325 **4 Claims**



1. A method of repeatedly dressing and finishing a grinding wheel in a machine wherein the grinding wheel is dressed by a rotary dressing tool and is thereupon finished as a result of introduction of particulate material into a gap of predetermined width which is established between the working surface of the grinding wheel and a rotary pressure applicator which is coaxial with the grinding wheel, comprising the steps of dressing the grinding wheel; finishing the grinding wheel with attendant reduction of the dimensions of the pressure applicator; grinding the pressure applicator; memorizing information pertaining to the radius of the ground pressure applicator; utilizing the dressed and finished grinding wheel for the treatment of workpieces with the resulting need for renewed dressing and finishing; dressing and finishing the grinding wheel including selecting the distance between the axis of the grinding wheel and the common axis of the dressing tool and pressure applicator as a function of the memorized information; and grinding the pressure applicator including reducing the distance between the grinding wheel and the pressure applicator in comparison with such distance in the course of the preceding grinding of the pressure applicator by a value not less than the extent of wear upon the pressure applicator in the course of one of said finishing steps irrespective of the developing increasing difference between the positions of the wheel-contacting surfaces of the dressing tool and pressure applicator relative to each other.

4,557,079

SPIN BLASTER

Gary Sheesley, Levittown, Pa., assignor to Empire Abrasive Equipment Corporation, Langhorne, Pa.

Filed Jun. 22, 1984, Ser. No. 623,070

Int. Cl.⁴ B24C *3/06*

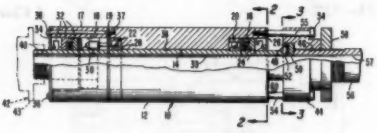
U.S. Cl. 51—411 **2 Claims**

1. In a spin-blast device of the type in which a nozzle is rotated by the reactive force of a carrier fluid under pressure and thereby blast-cleans the interior surfaces of tubular objects with streams of abrasive media carried by said fluid, the improvement that comprises:

(a) a main housing having an end-to-end bore;

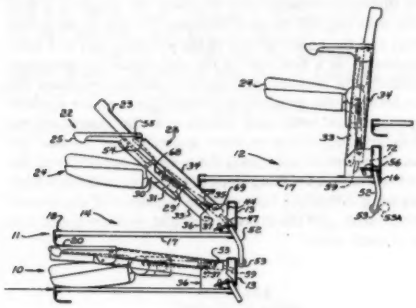
(b) a nozzle support shaft having a longitudinal passage for the carrier fluid, the shaft rotating in the bore, and having means at one end for attaching the nozzle thereto;

(c) a junction housing aligned axially with the main housing and having a center opening;
(d) a non-rotatable carrier fluid supply conduit mounted in the opening end-to-end with the shaft to provide a path along which the carrier fluid flows to the nozzle;
(e) at least one gasket sealably compressed between the shaft and conduit;
(f) means connecting the main and junction housings in spaced relation to provide a gap through which carrier fluid and abrasive media leaking past the gasket may be dispersed to ambient atmosphere;



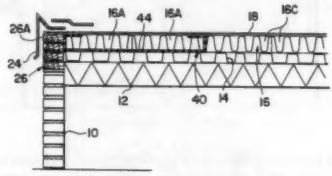
(g) means for selectively adjusting the compression of the gasket, the conduit being threadedly engaged in the opening of the junction housing for advancement toward and away from the shaft so as to provide said means for adjusting the compression of the gasket; and
(h) a locking collar threadedly engaged with the conduit for advancement into locking engagement with the junction housing whereby to preserve selected threaded adjustments of the conduit within the opening of the junction housing.

4,557,080
AUTOMATIC SEATING FOR TELESCOPING ROW SYSTEMS
Robert S. Walworth; Jay Hinshaw, both of Grand Rapids, and Arnold H. LaBotz, Grandville, all of Mich., assignors to American Seating Company, Grand Rapids, Mich.
Filed Jul. 18, 1984, Ser. No. 631,919
Int. Cl.[4] E04H *3/12*
U.S. Cl. 52—9 **13 Claims**



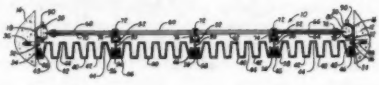
1. In a telescoping seating system having a plurlity of rows adapted for movement between a use position in which said rows are in tiered relation and a storage position in which a lower row is at least partially nested beneath a higher row, each row including a deck and seating means, the improvement comprising: stancheon means for supporting said seating means and including first and second frame members each pivotally mounted to said row at spaced locations and adapted to be rotated in unison between a generally upright use position and a generally horizontal storage position; and spring means connected between said frame members for biasing them to the use position, said frame members and spring being constructed and arranged such that the force of said spring biasing said frame members to the use position is decreased as said frame members are moved to the use position.

4,557,081
ROOFING STRUCTURE WITH HERMETICALLY SEALED PANELS
Thomas L. Kelly, 31 Sands St., Waterbury, Conn. 06723
Filed Nov. 1, 1982, Ser. No. 438,258
Int. Cl.[4] E04B *7/00*
U.S. Cl. 52—94 **14 Claims**



1. For use in roofing installations providing resistance to wind uplift conditions, a roofing structure comprising a deck, insulating materials supported on the deck and including a multiplicity of individual insulation blocks disposed in overlying relation to the deck, sheet means enveloping a plurality of said individual insulation blocks which blocks overlie a portion of the deck, said sheet means defining a panel encapsulating a plurality of individual insulation blocks, said structure further including a plurality of such encapsulating panels which collectively form a wind uplift resistant section of the deck.

4,557,082
WIDE EXTENSION EXPANSION JOINT ASSEMBLY
Charles L. Dunsworth, Midwest City, Okla., assignor to Metalines, Inc., Oklahoma City, Okla.
Filed May 17, 1984, Ser. No. 611,219
Int. Cl.[4] E04B *1/68*; E04F *15/14*
U.S. Cl. 52—109 **19 Claims**



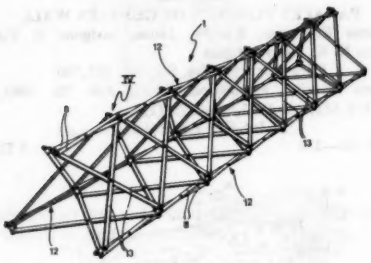
1. Apparatus for enclosing an expansion void between first and second building structures, comprising:
first and second elongate side extrusions each defining a respective guide channel along the length thereof, said side extrusions being secured in parallel on said first and second building structures;
cover means supported to extend laterally over said first and second side extrusions;
expansible multi-link lazy tong means centrally affixed to said cover means by pivotal connection to retain said cover means; and
first and second guide means pivotally affixed on opposite sides of said lazy tong means and being slidably retained in said respective first and second side extrusion guide channels.

4,557,083

EXTENSIBLE ARM, PARTICULARLY FOR SPACE MODULES OR VEHICLES

Agostino Zanardo, Padua, Italy, assignor to Aeritalia Societa Aerospaziale Italiana p.A., Turin, Italy

Filed Sep. 26, 1984, Ser. No. 654,454
Claims priority, application Italy, Sep. 30, 1983, 68013 A/83
Int. Cl.[4] E04H *12/18*
U.S. Cl. 52—109 4 Claims



1. Extensible arm having a reticular lattice structure with a polygonal cross-section, particularly for space modules or vehicles,

wherein each longitudinal side of the lattice structure includes first and second kinematic pantograph chains arranged in the same plane each constituted by a plurality of rods articulated together so as to define a series of aligned X-shaped elements, in that the rods of the second kinematic chain are shorter than the rods of the first kinematic chain, and in that the articulation axes between the X-shaped elements of the second kinematic chain located on one side of the series of X-shaped elements of the second kinematic chain coincide with the articulation axes between the X-shaped elements of the first kinematic chain located on the same side of the series of the X-shaped elements of the first kinematic chain,

whereby the lattice structure can adopt any configuration between a fully retracted configuration in which the kinematic chains constituting the structure are all closely packed, and a fully extended configuration in which the rods of the X-shaped elements of the second kinematic chain are substantially parallel to each other so as to define straight struts in correspondence with the vertices of the lattice structure, and the rods of the X-shaped elements of the first kinematic chain are located as diagonals connecting the struts.

4,557,084

ENERGY EFFICIENT BUILDING WITH UNDERGROUND CONCRETE WALLS

Robert F. Dumbeck, P.O. Box 548, Elgin, Tex. 78621

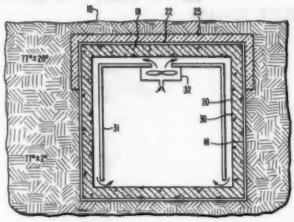
Filed Feb. 2, 1984, Ser. No. 576,433
Int. Cl.[4] F02D *27/32*
U.S. Cl. 52—169.11 13 Claims

1. The method of building an energy efficient house comprising the steps of:

building outer walls on the house with concrete thermally conductive from outer to inner surfaces thereof buried to a significant depth in the ground to assure that it extends to a ground depth, where the temperature change is not significantly affected by the ambient above ground air temperature with the inner wall surface within the house disposed for circulation of air thereacross,

insulating the outer surface of the concrete only near the surface of the earth down to a depth at which the temperature change from summer to winter is significantly reduced,

thermally contacting the outer concrete walls in good thermal exchange relationship at lower depths with the earth to establish a temperature on the inside surfaces of the concrete walls substantially that of the adjacent earth that does not significantly change from summer to winter, and employing the concrete wall inner surfaces below the insu-



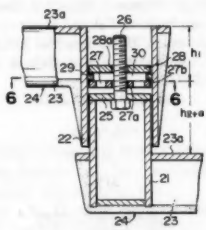
lated outer surface as an active energy exchange surface comprising the primary energy source for establishing an inside house temperature by means of the circulation of air across the wall inner surfaces, whereby the active surface is near to the human comfort zone year round and requires little external energy for heating and cooling.

4,557,085

FIXING MECHANISM FOR STAIR UNITS FACILITATING ADJUSTMENT OF HEIGHT

Kelichirou Yamazaki, No. 12-1, 6-chome, Kameido, Koutou-ku, Tokyo-to, Japan

Filed Sep. 12, 1983, Ser. No. 530,993
Claims priority, application Japan, Sep. 14, 1982, 57-158964; Sep. 14, 1982, 57-158965
Int. Cl.[4] E04F *11/02*
U.S. Cl. 52—182 5 Claims



1. A stair unit of the type utilizing two cylindrical members, one of which has an outer diameter smaller than the inner diameter of the other cylindrical member, are juxtaposed in a spaced-apart relation in the vertical direction and an element is disposed between said cylindrical members so as to provide a fixing mechanism for stair units, comprising:

a screw member disposed on the axis of said cylindrical member having a smaller diameter and rotatably fixed to the cylindrical member;

an anchor member rigidly fixed to said cylindrical member having a greater diameter; and

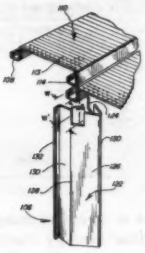
upper and lower nut members constituted so that said lower nut member can be rotated through an opening in said upper nut member.

4,557,086

GRAIN BIN FLOOR SUPPORT SYSTEM

Allen C. Liefer, R.R. 3. Box 362, Macon, Mo. 63552; Gilbert L. Loewen, and Paul J. Magathan, both of Peabody, Kans., assignors to Allen C. Liefer, Peabody, Kans.

Filed Mar. 3, 1983, Ser. No. 471,860
Int. Cl.[4] E04H 7/00; E04B 5/00
U.S. Cl. 52—194 16 Claims



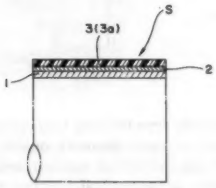
1. An aeration flooring combination for storage bins comprising a plurality of perforated floor panels each having opposite side edges, said panels being disposed in side by side generally coplanar relationship with one another whereby the respective side edges of adjacent panels are adjacent to one another, a support beam having opposite sides and extending lengthwise of and subjacent each such pair of adjacent panel side edges, and a plurality of support posts each having diverging sides, a plurality of said support posts subtending each of said beams and being in generally vertical alignment therewith for vertical support of such beam above a subjacent base, and each of said posts being in gripping engagement by spring tension of said diverging sides with opposite sides of the respective beam.

4,557,087

METALLIC SHEATH FOR A POSTTENSIONING METHOD PROVIDED WITH RUST PROOFING TREATMENT

Toshiyuki Kitta, Omiya, and Wataru Abe, Hiratsuka, both of Japan, assignors to Japanese National Railways and Oiles Industry Co., Ltd., both of Tokyo, Japan

Filed Sep. 1, 1983, Ser. No. 528,423
Claims priority, application Japan, Sep. 4, 1982, 57-153368; Dec. 16, 1982, 57-219322
Int. Cl.[4] E04C 3/10
U.S. Cl. 52—230 2 Claims



1. A sheath or tube for encasing a tendon for the post-tensioning of concrete structural components exposed to corrosive chemicals consisting of:

(a) a metal tube;

(b) a corrosion inhibiting coating of a phosphate compound upon the inner and outer surfaces of said metal tube;

(c) an epoxy resin coating on the phosphate compound coating on the outer surface of said metal tube; and

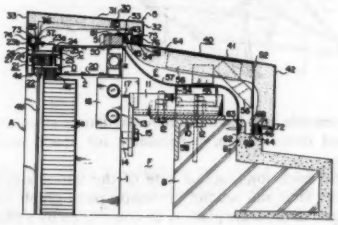
(d) a solid lubricant coating on the phosphate compound coating on the inner surface of said metal tube, said solid lubricant coating comprising 20–60 volume percent of polytetrafluoroethylene, 10–50 volume percent of a soft metal, a metal sulfide or a mixture thereof, and 30–70 volume percent of a styrenated alkyd as a binder.

4,557,088

PARAPET PORTION OF CURTAIN WALL

Hiromitsu Kaminaga, Kurobe, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Apr. 19, 1984, Ser. No. 601,790
Claims priority, application Japan, Apr. 26, 1983, 58-61461[U]; May 19, 1983, 58-73755[U]
Int. Cl.[4] E04H 5/00
U.S. Cl. 52—235 5 Claims



1. An improved structure of a parapet portion of a curtain wall, comprising a plurality of panel units each having outdoor side and indoor side members provided at the top of said curtain wall and a connector made of heat-insulating material for interconnecting said outdoor side and indoor side members to each other, means for connecting said indoor side member of each panel unit to a building body. a coping having its opposite end portions fixedly secured to said outdoor side member and said building body, respectively, so as to bridge them, and a damp-proofing sheet mounted to said indoor side member and said building body so as to extend therebetween, whereby a heat-insulating and damp-proofing layer is formed between said coping and said damp-proofing sheet and indoor side member.

4,557,089

STRUCTURAL ELEMENT SUCH AS BUILDING FACADE AND THE LIKE

Albert Breithaupt, Cologne, Fed. Rep. of Germany, assignor to Trube & Kings KG, Fed. Rep. of Germany

Filed Jan. 27, 1983, Ser. No. 461,655
Claims priority, application Fed. Rep. of Germany, Feb. 3, 1982, 3203625
Int. Cl.[4] E04B 1/70
U.S. Cl. 52—235 28 Claims

1. A fire protection element for holding filling elements for building facades, comprising:

a composite connection body having at least one statically loadable bearing body;

a fire suppressant material surrounding the bearing body;

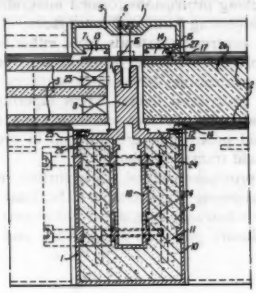
a covering around said fire suppressant material;

the bearing body being a hollow element with an aluminum core;

the aluminum core and the covering being separated from each other by the fire suppressant material;

further comprising a cover strip mounted so as to hold filling element between the cover strip and the bearing body, the

cover strip and the composite connection body including recesses;



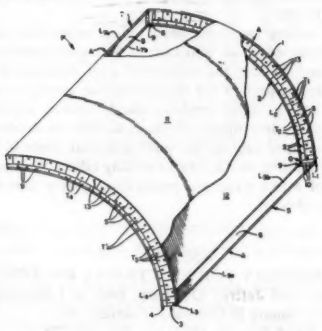
sealing strips disposed within the recesses to provide a seal relative to the filling elements.

4,557,090

CURVILINEAR STRUCTURAL INSULATING PANEL AND METHOD OF MAKING THE SAME

Robert R. Keller, Sr., 10 Heritage Rd., Bedford, N.H. 03102

Filed Oct. 7, 1983, Ser. No. 540,013
Int. Cl.[4] E04C *2/34*
U.S. Cl. 52—245 **19 Claims**



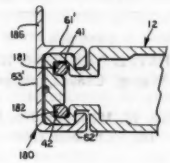
1. An insulating curvilinear panel structure having, in combination, a panel frame bounding a portion of a curve and formed by a pair of spaced similarly curved I-beam members joined between their ends by a pair of straight I-beam members; each curved I-beam member being formed by a pair of oppositely directed similarly curved T-shaped beam members having the long portion of the T's slotted into tabs and overlapped and joined together with the slots of each of the pair of T-shaped beams members deformed to accomodate the curve and staggered with respect to the slots of the other of the pair along the arc of their curve; and insulating cover sheet material formed as curved outer and inner coaxial surfaces adhered to the corresponding outer and inner cross portions of the I-beams that serve as load-bearing edge surfaces of opposite sides of the frames.

4,557,091

EXTRUDED STRUCTURAL SYSTEM

Jay R. Auer, Dunwoody, Ga., assignor to Corflex International, Inc., Warren, Ohio

Continuation of Ser. No. 347,416, Feb. 10, 1982, abandoned.
This application Mar. 1, 1985, Ser. No. 694,185
Int. Cl.[4] E04B *2/32*
U.S. Cl. 52—282 **1 Claim**



1. A structural panel having a thickness of a first dimension, comprising:

a pair of parallel planar outer wall members whose outer surfaces are separated by said first dimension;

at least one reinforcing rib of generally I-shape joining said pair of wall members;

reinforcing shoulder means formed at each intersection of a surface of said rib with a surface of one of said pair of wall members for imparting rigidity to said panel;

flange means formed along the longitudinal edges of said wall members and extending inwardly from each of said wall members toward the opposite wall member; and

at least one panel connecting member for joining said panel to an adjacent panel, said connecting member extending outwardly from said flange means and forming an outer longitudinal edge of said panel and including

a neck portion extending outwardly from said flange means and between said wall member, and

a head portion attached to said neck portion and having a thickness of a second dimension less than said first dimension,

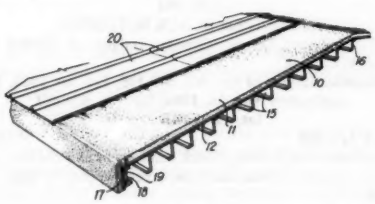
said head portion including on the interior surface of said head portion opposite said wall members an inwardly extending tab, said dividing the interior of said head portion into a pair of equally shaped opposed channels for receiving therein elongate reinforcing cable means, and further comprising second reinforcing shoulder means formed at each intersection of a surface of said flange means with a surface of one of said pair of said wall members.

4,557,092

SAFETY REINFORCED ROOF INSULATION

Ralph H. Brueske, Kansas City, Mo., assignor to Butler Manufacturing Company, Kansas City, Mo.

Filed Aug. 22, 1984, Ser. No. 643,233
Int. Cl.[4] E04B *1/74, 5/00*
U.S. Cl. 52—404 **11 Claims**



1. A safety reinforced roof insulation particularly for metal building roofs comprising:

means for strengthening said roof insulation internally thereof so that it can support a worker who might inadvertently step thereon including;

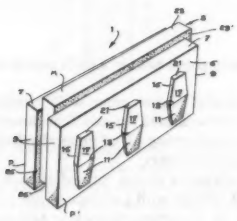
a layer of thermal insulation, a bottom facing element on and united with said layer, and a safety reinforcement component disposed between said layer and facing and being concealed and forming a permanent integral component of the roof insulation.

4,557,093

INSULATED BUILDING BLOCK

Jean L. Beliveau, Magog, Canada, assignor to EPSM Inc., Granby, Canada

Filed Feb. 10, 1984, Ser. No. 579,195
Int. Cl.[4] E04B *2/00*
U.S. Cl. 52—405 **9 Claims**



1. A core made of heat insulating material for use in a building block, said core comprising:

a body having opposed parallel flat outer faces, each face being bound by parallel longitudinal edges and parallel side edges, said body having a transverse plane normal to said outer faces and essentially centrally between said longitudinal edges;

a series of locking protrusions formed integrally with said body and projecting from said outer faces;

wherein each protrusion extends from either side of said transverse plane toward said longitudinal edges;

wherein said protrusions have outer surfaces and lateral edges, said protrusion lateral edges tapering inwardly between said outer surfaces and said body outer faces whereby said protrusions are dovetail in cross-sections parallel to said transverse plane;

wherein said protrusion lateral edges further make angles with said transverse plane suitable to facilitate demolding of said core when said core is molded in two half molds having a closure plane co-planar with said transverse plane, and

wherein said protrusion lateral edges are parallel to each other and perpendicular to said transverse plane, on one side of said transverse plane, and taper toward one another on the other side of said plane to terminate short of the respective longitudinal edge.

4,557,094

INSULATED BLOCK BUILDING

Jean L. Beliveau, Magog, Canada, assignor to EPSM Inc., Granby, Canada

Continuation-in-part of Ser. No. 579,195, Feb. 10, 1984. This application Nov. 26, 1984, Ser. No. 674,664
Int. Cl.[4] E04B *2/00*
U.S. Cl. 52—405 **8 Claims**

1. An insulating building block made up of an insulating core and two concrete walls, each cast over one side of said core, wherein

(A) said core comprises:

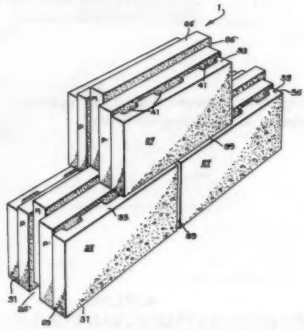
a body having opposed parallel flat outer faces, each face being bound by parallel longitudinal edges and parallel side edges, said body having a transverse plane normal to said outer faces and essentially centrally between said longitudinal edges;

a series of locking protrusions formed integrally with said body and projecting from said outer faces;

wherein each protrusion extends from either side of said transverse plane toward said longitudinal edges;

wherein said protrusions have outer surfaces and lateral edges, said protrusion lateral edges tapering inwardly between said outer surfaces and said body outer faces whereby said protrusions are dovetail in cross-sections parallel to said transverse plane, and

wherein said protrusion lateral edges further make angles with said transverse plane suitable to facilitate demolding of said core when said core is molded in two half molds having a closure plane co-planar with said transverse plane,



and wherein

(B) each concrete wall comprises:

a concrete slab formed with cavities into which said protrusions are set;

said slab having two contiguous edges extending past two contiguous edges of said core a first predetermined distance and having the remaining two contiguous edges terminating short of the remaining two contiguous edges of said core a second predetermined distance, greater than said first predetermined distance, suitable to define therewith L-shaped rabbets for making mortar joints in the use of said building block, like extending edges of an adjacent block of a like structure penetrating partly into said L-shaped rabbets.

4,557,095

VENT ASSEMBLY FOR ELECTRICAL ENCLOSURE

Paul D. Rice, and Jeffrey O. Sharp, both of Lexington, Ky., assignors to Square D Company, Palatine, Ill.

Filed Jun. 29, 1983, Ser. No. 509,278
Int. Cl.[4] E06B *7/08*
U.S. Cl. 52—473 **13 Claims**

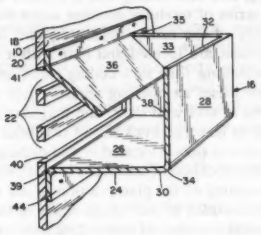
1. A vent assembly for electrical equipment, comprising:

a panel for covering the equipment, said panel having at least one elongated slot extending therethrough, a front side, and a rear side;

a box member secured to the rear side of the panel over the slot, said box member having a first elongated plate extending outwardly from the rear side of the panel on one side of the slot and an elongated second plate extending from an outer end of the first plate over the slot at an angle to the first plate, said second plate having an outer edge; said box member further including a pair of opposite side tabs positioned substantially at right angles with said first plate and said second plate, and

an elongated flange extending from the rear side of the panel on an other side of the slot at an angle to the panel and

being generally directed toward said outer end of said first plate, said flange having a length substantially spanning the distance between said side tabs and having an outer edge and a width sufficiently long such that the flange



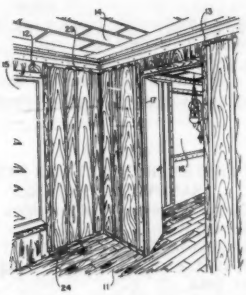
intersects a straight line taken from the side of the slot nearest the box member and the outer edge of the second plate, said outer edge of said flange spaced away from said first plate and from said second plate enabling the passage of air through said assembly.

4,557,096

WALL BOARDINGS

Oskar Hovde, Kyvannsveien 34, N-7000 Trondheim, Norway

Filed Mar. 18, 1983, Ser. No. 477,172
Int. Cl.[4] E04C *1/10*
U.S. Cl. 52—595 **12 Claims**



1. Wall boarding of predetermined external pattern for rooms with a ceiling, a door frame and a window frame and comprising:

(a) a series of wainscoting elements mounted vertically in parallel and undercut at all edges,

(b) strip-shaped lining moldings for vertical and horizontal mounting, said vertical lining moldings being received at least between adjacent wainscoting elements in opposite undercut longitudinal side edges thereof while said horizontal lining moldings are received in undercut end edges of said wainscoting elements,

(c) a first cover strip for mounting horizontally beneath said ceiling and having upper and lower opposite side edges which are undercut, said lower side edge receiving one of said horizontal lining moldings at its upper side while its lower side is received in undercut upper end edges of the wainscoting elements,

(d) another strip-shaped molding received by the upper side edge of said first cover strip and extending up to the ceiling,

(e) a second cover strip for mounting horizontally adjacent said door frame and undercut at at least its upper side edge,

(f) a first sheet means arranged between said first and second cover strips so that its upper edge is received by an undercut lower side edge of said first cover strip while its lower edge is received by the undercut upper side edge of said second cover strip,

(g) a third cover strip for mounting horizontally adjacent said window frame and undercut at at least its lower side edge, and

(h) a second sheet means arranged between the floor and said third cover strip so that its upper edge is received by said undercut lower side edge of said third cover strip,

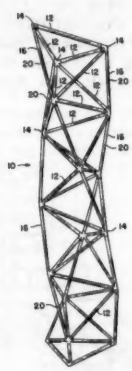
each of said wainscoting elements having a longitudinal side edge undercut to a lateral depth substantially greater than that of its opposite undercut longitudinal side edge enabling vertical lining moldings of different breadths to be used while maintaining said predetermined external pattern of said wall boarding by regulating the extent to which said wainscoting element overlaps the breadth of its adjacent vertical lining molding.

4,557,097

SEQUENTIALLY DEPLOYABLE MANEUVERABLE TETRAHEDRAL BEAM

Martin M. Mikulas, Jr., Williamsburg, Va., and Robert F. Crawford, Santa Barbara, Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Sep. 8, 1983, Ser. No. 530,339
Int. Cl.[4] E04H *12/18*
U.S. Cl. 52—646 **6 Claims**



1. A highly maneuverable and fully collapsible tetrahedral beam comprised of a plurality of interconnected tetrahedral, each tetrahedron including:

(a) five fixed length battens;

(b) joint means joining said battens into batten frames to form two equilateral triangles and providing two rotational degrees of freedom at each joint;

(c) two batten frames sharing a common base batten; and

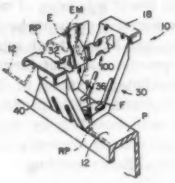
(d) a longeron connecting each of the apexes of said batten frames, said longeron including a foldable hinge at its mid-point and being pivotally hinged at its ends to said joint means.

4,557,098

DEFORMABLE CENTERING SLEEVE FOR TAB OF ROOF PANEL ATTACHMENT CLIP UNIT

Vernon L. Thurnau, Kansas City, and Arturo Mariano, Independence, both of Mo., assignors to Butler Manufacturing Company, Kansas City, Mo.

Filed Mar. 1, 1984, Ser. No. 585,161
Int. Cl.[4] E04B *1/56*
U.S. Cl. 52—712 **57 Claims**



1. A structural device for attaching roof panels to a support element of a building comprising:

a support yoke;

a cross-piece supported by said support yoke;

an attaching tab for engagement with a pair of complementary roof panels as supported by said support yoke, said attaching tab encircling and being slidably mounted on said cross-piece; and

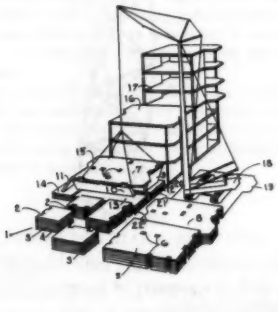
longitudinally deformable centering means mounted on each side of said attaching tab as mounted on said cross-piece for retaining said tab centered with respect to the support yoke during initial roof panel installation and yet permitting movement of said tab thereafter during thermal expansion/contraction of said roof panels.

4,557,099

METHOD OF CONSTRUCTING FOLDABLE CONCRETE SLAB BUILDINGS WITH ACCESS SLOTS THRU CEILING SLABS FOR INSTALLING HINGEABLE CONNECTORS

Delp W. Johnson, 240 Oakview Dr., San Carlos, Calif. 94070

Filed Aug. 1, 1983, Ser. No. 519,082
Int. Cl.[4] E04B *1/344*; E04G *21/14*
U.S. Cl. 52—745 **17 Claims**



1. An improved method of constructing a foldably constructing building on a foundation floor, said method comprising the steps of:

A. forming and casting on site a series of wall slabs in horizontal position, each of said wall slabs having a hinge edge and a foot edge, and said walls are so arranged in the casting so that said hinge edges are positioned relative to each other in the same relationship that they will have in the erected building, and a connection means is embedded in each of said hinge edges at at least two spaced apart locations; and

B. forming and casting on site at least one layer of ceiling slabs in a horizontal layer for entire floor of proposed building, and said ceiling slab is divided by division lines into a series of modular sections according to the lifting capability of the lifting apparatus, and in addition, said ceiling slabs are formed and cast with a series of access slots extending thru said ceiling slabs, and each of said slots comprises an opening almost equal in width to the thickness of said wall slabs, and length of said access slot equal to at least the thickness of said wall slabs, and each of said access slots is located in said ceiling slab according to the plan location of said walls in said proposed building, and according to the plan position of the said connection means embedded in said hinge edges of said walls, and

C. positioning a section of said ceiling slabs on top of a group of said wall slabs, said group being the walls that are related to the ceiling section in the erected building, and positioning of said ceiling slab positions said access slots directly over said connection means, and

D. inserting a connection device down thru said access slots to engage said connection means, said connection device being of the type that permits the hinge edge of said wall to pivot freely under the underside surface of said ceiling slab when said ceiling slab is elevated, and

E. connecting said device to said connection means, and

F. elevating said ceiling slab section and causing said hinge edges to be elevated simultaneously and causing said walls to depend to a vertical position forming a building module, and

G. lifting said module into position over the section of said foundation floor where it is to be placed, and

H. lowering said module into position causing said walls to bear upon said foundation floor, and

I. lowering said ceiling slab to bear on said walls, and

J. securing said walls to said foundation floor, and

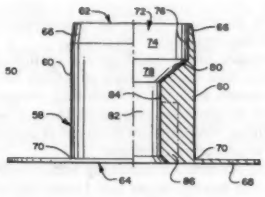
K. repeating steps C thru J to erect a complete building.

4,557,100

UNITARY FASTENER INSERT FOR STRUCTURAL SANDWICH PANELS

Friedrich J. Gorges, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

PCT No. PCT/US83/00174, § 371 Date Feb. 7, 1983, § 102(e) Date Feb. 7, 1983, PCT Pub. No. WO84/03130, PCT Pub. Date Aug. 16, 1984
PCT Filed Feb. 7, 1983, Ser. No. 491,952
Int. Cl.[4] E04C *2/34*
U.S. Cl. 52—787 **4 Claims**



1. An insert adapted to be used in securing a structural sandwich panel to a substrate, where the panel and the substrate have first and second aligned openings, respectively, to receive said insert and a fastener which extends through said insert, and where the fastener has a downwardly tapered head portion and a shank portion which extends through said insert and through the second opening in the substrate, said insert being a substantially unitary forged structure comprising:

a. a main body portion having a substantially uniform outer

cylindrical surface and adapted to fit in the first opening in the panel;

b. a lower peripheral flange extending outwardly from a lower edge of said insert and adapted to engage a lower surface portion of said panel surrounding said first opening;

c. an upper peripheral annular tip portion extending upwardly from said body portion as a substantial upward cylindrical extension of said main body portion and arranged to extend above an upper panel surface portion surrounding said first opening, and further adapted to be swaged downwardly to engage said upper panel surface portion;

d. said body portion being provided with an internal bore comprising:

1. an upper seat region to receive the head of the fastener, said seat region being located below said tip portion and having a downwardly and inwardly extending frustoconical surface;

2. an intermediate generally cylindrical shank receiving region extending downwardly from a lower edge of said upper seat region;

3. a lower counterbore region having a generally cylindrical configuration with a diameter greater than said shank receiving region and extending to said flange.

4,557,101

METHOD AND APPARATUS FOR ATTACHING A TOKEN TO A CONTAINER

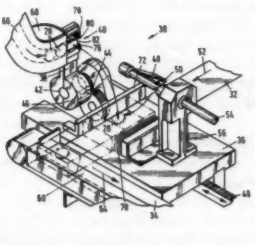
Eugen Hesterberg, Berlin, Fed. Rep. of Germany, assignor to B.A.T. Cigaretten-Fabriken GmbH, Fed. Rep. of Germany

Filed Feb. 17, 1983, Ser. No. 467,398

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1982, 3206077

Int. Cl.⁴ B65B *61/00*; B65C *9/08*

U.S. Cl. 53—50 **16 Claims**



1. A method for attachment of a coin-like token to a generally parallelepipedic container, such as a cigarette box, of the type formed from stiff material and having a hinged cover with a front flap which forms a transverse abutment line with the front face of the container in its closed position, the container including an insert portion lying adjacent the front flap of the cover, the insert portion surface being surrounded by the cover in the closed position, comprising the steps of:

forming in the insert portion a recess of the general size and shape of the token to be inserted,

securely holding the container with its front face up and the cover closed,

placing a token on the front face of the container adjacent the abutment line,

pressing downwardly on the front face of the container to form a slit-like opening between the front face and the lower edge of the cover flap,

pushing the token under the flap through the opening, and releasing the downward pressure.

4,557,102

HAND WRAPPING APPARATUS

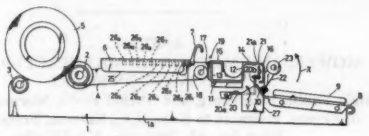
Shigeru Ikemoto, 36 Honmaeda-cho, Nakagawa-ku Nagoya, Japan

Filed Sep. 29, 1983, Ser. No. 536,998

Claims priority, application Japan, Oct. 12, 1982, 57-178842

Int. Cl.⁴ B65B *57/04, 11/02*

U.S. Cl. 53—66 **1 Claim**



1. A hand wrapping apparatus comprising:

a frame structure;

a film roll supported on a pair of spaced support rollers mounted on one side of said frame structure, and having its outer periphery engaged with the outer periphery of said rollers;

a film withdrawal port provided at the other side of said frame structure to introduce the film on said filmroll exteriorly of said frame structure for covering the product to be wrapped;

a severing structure provided with said frame structure to sever the film introduced from said film withdrawal port;

a film length determiner structure to detect the leading end of the film thrown around the product to calculate the successive length of the film required for wrapping;

a film length detector structure to detect length of the film withdrawn as calculated by said determiner structure to produce a detector signal; and

a lock structure to apply braking action to a said support roller to stop withdrawal of the film on the basis of the detector signal from said detector structure.

4,557,103

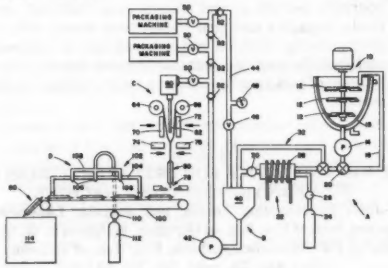
APPARATUS FOR SQUEEZE PACKAGING BUTTER-LIKE PRODUCTS

Charles A. Schwartz, Highland Heights, and Kenyon L. Cornwell, Cleveland, both of Ohio, assignors to Sar-A-Lee, Inc., Beechwood, Ohio

Continuation-in-part of Ser. No. 582,377, Feb. 22, 1984, which is a continuation-in-part of Ser. No. 451,075, Dec. 20, 1982, Pat. No. 4,447,464, which is a continuation-in-part of Ser. No. 423,063, Sep. 24, 1982, abandoned.

Int. Cl.⁴ B65B *63/08, 9/12*

U.S. Cl. 53—111 R **14 Claims**



1. An apparatus for packaging products which are damagable by heat in heat-sealed squeeze packets, the apparatus comprising:

a viscosity adjusting means for adjusting the viscosity of the product to the equivalent of about 16,000 to 18,000 centipoise;

a metering means for selectively metering preselected volumes of the product to at least one filling nozzle;

sheet feeding means for feeding sheets of a heat-sealable material adjacent opposite sides of the filling nozzle;

heat sealing means for heat sealing the sheets into closed packets surrounding the preselected product volumes from the metering means to form filled squeeze packets; and,

cooling means disposed contiguous to the filling nozzle for cooling the squeeze packets before the product is damaged by residual heat in the heat seals.

4,557,104

MOWER, AND METHOD OF MANUFACTURING ITS TRANSMISSION SHAFT

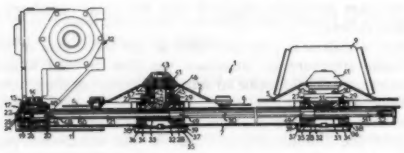
Alain Toillie, Strasbourg, and Michel Wolff, Marmoutier, both of France, assignors to Kuhn S.A., Saverne, France

Filed Jan. 13, 1983, Ser. No. 457,658

Claims priority, application France, Feb. 8, 1982, 82 02131

Int. Cl.⁴ A01D *55/18*

U.S. Cl. 56—13.6 **9 Claims**



1. A mower, comprising in combination

a housing,

at least one rotatable member connected to said housing and provided with cutting means,

a rotatable transmission shaft normally disposed in said housing and longitudinally insertable into, and withdrawable from, said housing,

rotatable gear transmission means arranged to transmit rotation of said transmission shaft to said rotatable member,

said transmission shaft having an operative portion in driving connection with said gear transmission means,

said operative portion of said transmission shaft having a transverse cross section of a predetermined shape and a predetermined dimension,

another portion of said transmission shaft being free from any association with said gear transmission means during operation of the mower when the operative portion is in driving engagement with said gear transmission means, and having a transverse cross-section with a shape substantially corresponding to the shape of said operative portion and a dimension smaller than the dimension of said operative portion of said transmission shaft and, respectively, engaging said gear transmission means sufficiently during sliding insertion and, respectively, withdrawal, of said shaft through said gear transmission means, to restrain rotation of said gear transmission means during the sliding motion.

4,557,105

METHOD AND DEVICE FOR PREPARING FIBERS FED TO A FRICTION SPINNING MACHINE

Karl-Josef Brockmanns, Anrath, and Joachim Lünenschloss, Aachen, both of Fed. Rep. of Germany, assignors to W. Schlafhorst & Co., Moenchengladbach, Fed. Rep. of Germany

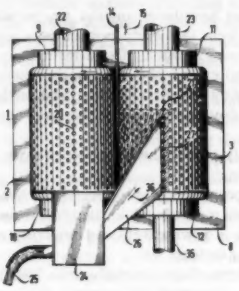
Filed Aug. 23, 1984, Ser. No. 643,652

Claims priority, application Fed. Rep. of Germany, Aug. 23, 1983, 3330414

Int. Cl.⁴ D01H *1/135*

U.S. Cl. 57—401 **6 Claims**

1. Method of preparing fibers fed from a fiber-loosening device into a wedge-shaped spinning zone of a friction spinning machine having friction elements moveable relative to one another, which comprises feeding a fiber-laden carrier-air flow having a component directed parallel to the wedge-shaped spinning zone tangentially to one of the friction elements at a location outside the wedge-shaped spinning zone and in a direction opposite the direction of movement of the one friction element, simultaneously exerting holding forces on



the fibers and flinging the fibers against the moving surface of the one friction element so that the fibers are stretched out and held fast thereon, conveying the fibers in held-fast condition thereof into the wedge-shaped spinning zone, rolling the fibers therein and integrating the fibers into a yarn, and drawing-off the thus-formed yarn.

4,557,106

COMBUSTION SYSTEM FOR A GAS TURBINE ENGINE

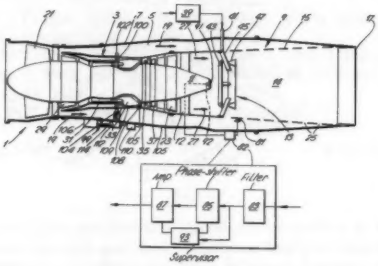
John E. Ffowcs Williams, 298 Hills Rd., Cambridge; Philip J. Dines, 86 The Green, Aston Abbots, Aylesbury, Buckinghamshire, both of England, and Maria A. Heckl, Kronprinzenstrasse, 41-43, 1000 Berlin 20, Fed. Rep. of Germany

Filed Oct. 26, 1984, Ser. No. 665,154

Claims priority, application United Kingdom, Nov. 2, 1983, 8329218

Int. Cl.⁴ F02C *7/045*

U.S. Cl. 60—39.281 **12 Claims**



1. A combustion system for a gas turbine engine, the combustion system incorporating a feedback loop for the control of an unstable combustion process in the combustion system, the feedback loop including:

sensor means for sensing a cyclically varying parameter of the unstable combustion process and producing a signal corresponding thereto;

control means for phase-shifting and amplifying the signal from the sensor means; and

exciter means for changing the boundary conditions of the combustion process in accordance with the phase-shifted amplified signal;

said control means including adaptive means for monitoring the strength of the sensor signal and varying the amount

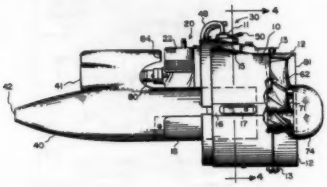
by which the signal is phase-shifted and amplified to obtain a sensor signal of minimum strength, whereby said unstable combustion is substantially eliminated.

4,557,107

POWER PLANT FOR MODEL JET AIRCRAFT

Robert S. Violett, P.O. Box 822, Casselberry, Fla. 32707, and W. Lee Andersen, 1233 S. Ross, Santa Ana, Calif. 92707

Filed Jun. 12, 1981, Ser. No. 272,914
Int. Cl.⁴ A63H *27/06*
U.S. Cl. 60—269 **18 Claims**



1. A power plant for model jet aircraft comprising:
an approximately cylindrical duct having an internal surface;
an engine mount having a forward cylindrical portion, having an external surface and an internal surface, said cylindrical portion essentially concentric with said duct and a rear engine mounting portion;
an engine having a forward projecting drive shaft and mounted on said rear portion of said engine mount having said drive shaft concentric with said forward cylindrical portion of said engine mount;
a vertically oriented carburetor mounted on said engine and projecting upward through the top surface of said duct, said carburetor having controls external to said duct;
primary stator means disposed forward of said carburetor for directing airflow through said duct around said carburetor and disposed between the external surface of said cylindrical portion of said mount and the internal surface of said duct for supporting said mount;
a plurality of secondary stators between the external surface of said cylindrical portion of said mount and the internal surface of said duct for supporting said mount, said primary stator, said secondary stators, and said duct defining a plurality of airflow passages from the front of said duct to the rear thereof; and
a multibladed fan disposed in and enclosed by the forward end of said duct, said fan mounted on said drive shaft, said fan driven by said engine to produce a generally spiralling airflow rearward through said airflow passages, said primary stator and secondary stators having an arcuate fore to aft shape for straightening said rearward airflow.

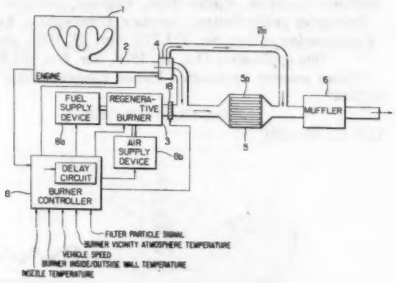
4,557,108

COMBUSTION APPARATUS FOR VEHICLE

Koichi Torimoto, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 29, 1984, Ser. No. 666,224
Claims priority, application Japan, Oct. 31, 1983, 58-170519
Int. Cl.⁴ F01N *3/02*
U.S. Cl. 60—286 **4 Claims**

1. A combustion apparatus for a vehicle for regenerating a filter provided in an exhaust gas passage of an engine by burning and removing fine particles in the exhaust gas comprising:
a combustion chamber;
a fuel injection nozzle provided at the upstream side end of said combustion chamber;
an ignition plug provided in the vicinity of said nozzle at the downstream side of said nozzle;
an air supply passage for supplying coaxial air from the upstream to the downstream of said nozzle along the outer periphery of said nozzle;
a shut-off valve mounted at the downstream side end of said combustion chamber for preventing reverse flow of the exhaust gas; and



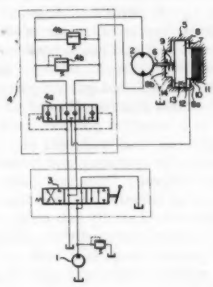
a controller for inflowing the coaxial air for a predetermined period of time after stopping the fuel supply from said nozzle and then closing said shut-off valve.

4,557,109

BRAKE FOR A HYDRAULIC MOTOR

Yoshikazu Nagahara, and Nobuaki Inaba, both of Yokohama, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Jul. 22, 1983, Ser. No. 516,361
Int. Cl.⁴ F16D *31/02*
U.S. Cl. 60—436 **2 Claims**



1. A brake apparatus in combination with a hydraulic moter having a rotatable output shaft, said apparatus comprising:
a cylinder;
a piston slidably mounted in said cylinder defining with said cylinder a first and a second chamber, said piston being slidably and rotatably mounted on the output shaft, said first chamber being selectively communicated with a pressurized fluid source and said second chamber being communicated with a drain;
spring means for biasing said piston towards said first chamber;
means for locking the output shaft against rotation when biased by said spring means;
a passage formed in said piston for communicating said first chamber with said second chamber;
a restrictor formed in said passage for restricting flow of fluid in said passage; and
a closure wall formed integral with the cylinder wall for closing said passage when said piston is hydraulically

biased towards said second chamber against the bias of said spring means.

4,557,110

MASTER CYLINDER ASSEMBLY FOR A VEHICLE BRAKING SYSTEM

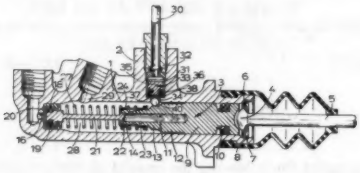
Anthony G. Price, Birmingham, England, assignor to Lucas Industries public limited company, Birmingham, England

Continuation of Ser. No. 373,275, Apr. 29, 1982, abandoned. This application Oct. 18, 1984, Ser. No. 662,530

Claims priority, application United Kingdom, May 20, 1981, 8115447

Int. Cl.⁴ F15B *7/08*

U.S. Cl. 60—581 **7 Claims**



1. A master cylinder assembly for a vehicle hydraulic system comprising first and second master cylinders, each said master cylinder comprising a housing having a bore, a piston working in said bore including a pressure seal, a pressure space defined in said bore in advance of said piston, and a transfer port in communication with said pressure space, a common transfer passage interconnecting said pressure spaces through said transfer ports when both said master cylinders are operated simultaneously, and transfer valve means for cutting-off communication between said pressure spaces when one of said master cylinders is operated on its own, wherein each piston is provided with a guide portion by means of which said piston is guided to slide in the respective one of said bores only by the sliding engagement of said guide portion with said bore, and said guide portion is disposed on the outermost side of said transfer port with which said transfer passage is in communication and between said transfer port and said pressure seal when said piston is in a retracted position, each said guide portion having an outer end, and each said piston having an axially extending portion for operating said transfer valve means and which extends integrally from said outer end of said guide portion and is of an effective area less than said guide portion, a discrete region of said axially extending portion co-operating with said valve means, said axially extending portion otherwise being spaced radially from said bore to define a clearance therebetween which constitutes a part of said pressure space, said guide portion comprising a sole support for said piston in said bore with said piston otherwise unsupported in said bore on said innermost side of said transfer port, at least when said piston is in said retracted position.

4,557,111

CONTROL SYSTEM FOR THE ENGAGEMENT AND DISENGAGEMENT OF EXHAUST GAS TURBOCHARGERS

Gerhard Haussmann, Tettnang, and Ewald Kamleitner, Friedrichshafen, both of Fed. Rep. of Germany, assignors to MTU Motoren und Turbinen-Union Friedrichshafen GmbH, Friedrichshafen, Fed. Rep. of Germany

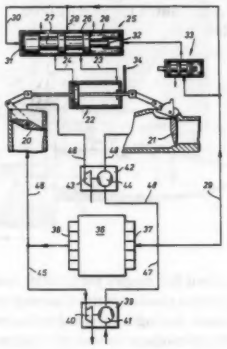
Filed Apr. 1, 1983, Ser. No. 481,156

Claims priority, application Fed. Rep. of Germany, Apr. 3, 1982, 3212498

Int. Cl.⁴ F02B *37/12*

U.S. Cl. 60—600 **21 Claims**

1. A control system for engagement and disengagement of an exhaust gas turbocharger for a piston driven internal combustion engine comprising actuating means operatively associated with valve means for disengaging the turbocharger by shutting off exhaust gas flow to and charging air flow therefrom and means for controlling said actuating means, said means for controlling including a slide member shiftable from a position wherein the turbocharger is disengaged to another position wherein the turbocharger is engaged, the slide member including a first control end face and a second control end face, spring means for biasing the slide member toward the



position wherein the turbocharger is disengaged, a first control pressure connected to the means for controlling acting on the first control end face of the slide member against the bias of the spring means and an additional control pressure connected to the means for controlling acting on the second control end face and means for reducing said additional control pressure in response to said first control pressure shifting said slide member from the position wherein the turbocharger is disengaged to the another position wherein the turbocharger is engaged.

4,557,112

METHOD AND APPARATUS FOR CONVERTING THERMAL ENERGY

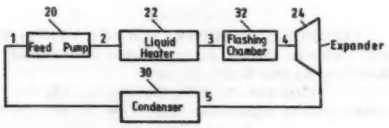
Ian K. Smith, London, England, assignor to Solmecs Corporation, Curacao, Netherlands Antilles

Filed Dec. 17, 1982, Ser. No. 450,613

Claims priority, application Israel, Dec. 18, 1981, 64582; United Kingdom, Oct. 4, 1982, 8228295

Int. Cl.⁴ F01K *25/08*

U.S. Cl. 60—651 **23 Claims**



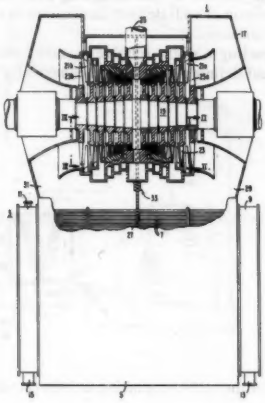
1. A method of converting thermal energy into another energy form, comprising the steps of substantially adiabatically pressurizing a liquid working fluid, supplying thermal energy to said working fluid, substantially adiabatically expanding the hot working fluid by flashing to yield said other energy form in an expansion machine capable of operating effectively with wet working fluid and of progressively drying said fluid during expansion, and condensing the exhaust working fluid received from the expansion machine.

4,557,113

SINGLE LOW PRESSURE TURBINE WITH ZONED CONDENSER

George J. Silvestri, Jr., Winter Park, and Joseph Davids, Maitland, both of Fla., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 15, 1984, Ser. No. 621,323
Int. Cl.[4] F28B 7/00
U.S. Cl. 60—693 3 Claims



1. A low pressure double flow steam turbine and condenser combination comprising:
- a shell and tube condenser in which cooling water is designated to flow through the tubes and steam to condense on the outer side of the tube;
- a turbine housing in fluid communication with the shell side of the condenser;
- a turbine rotor rotatably disposed within said housing;
- a steam inlet nozzle generally centrally disposed in said housing;
- a plurality of stationary and rotatable interdigitated blade rows forming within said turbine two steam flow paths which originate adjacent the inlet nozzle and are directed to opposite ends of said turbine;
- baffling disposed in said condenser and turbine to separate said condenser and turbine into two separate chambers, a low pressure chamber which encloses a portion of said condenser tubes through which influent cooling water is designated to flow and a high pressure chamber which encloses a portion of said condenser tubes through which effluent cooling water is designated to flow, whereby when in operation said chamber having influent cooling water in the tubes will operate at a lower pressure than said chamber having effluent cooling water in the tubes; the gauging of the last row of stationary blades in the steam flow path to the low pressure chamber is greater than the gauging in the last row of the stationary blades in the steam flow path to the high pressure chamber.

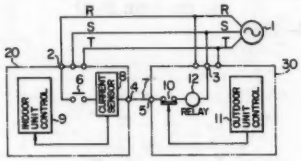
4,557,114

CONTROL CIRCUIT FOR AIR CONDITIONER

Takashi Kato; Tomio Yoshikawa, both of Shimizu; Keiji Sato, Shizuoka, and Kazuo Yoshioka, Shimizu, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 11, 1984, Ser. No. 619,539
Claims priority, application Japan, Jun. 15, 1983, 58-105803
Int. Cl.[4] F25B 49/00
U.S. Cl. 62—126 15 Claims

1. A control circuit for an air conditioner separated into an indoor unit and an outdoor unit which are connected to a power source and between which a signal line is connected for the control of the air-conditioner operation, said control circuit comprising:
- a three-phase power source common to said indoor unit and said outdoor unit;
- a signal line led out from two phases of said three-phase power source;
- a contact of an electromagnetic relay energizing a component of the air conditioner, said contact being connected on the portion of said signal line in said indoor unit in series with current sensor means sensing the current flowing through said signal line;



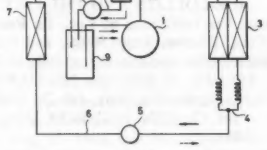
- a contact of a protective relay protecting said air-conditioner component, said contact being connected on the portion of said same signal line in said outdoor unit in series with said electromagnetic relay;
- a first controller disposed in said indoor unit for controlling the relay contact of said electromagnetic relay energizing said air-conditioner component; and
- a second controller disposed in said outdoor unit for energizing said protective relay contact thereby controlling on-off of said air-conditioner component.

4,557,115

HEAT PUMP HAVING IMPROVED COMPRESSOR LUBRICATION

Takashi Nakamura, Wakayama, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 16, 1984, Ser. No. 610,728
Claims priority, application Japan, May 25, 1983, 58-93635; May 25, 1983, 58-93636; May 25, 1983, 58-93637; May 25, 1983, 58-93638
Int. Cl.[4] F25B 31/00, 43/00
U.S. Cl. 62—156 7 Claims



1. In a heat pump comprising an accumulator, a serially connected compressor, a four-way valve, an outdoor heat-exchanger, a throttling device, an indoor heat-exchanger, a refrigerant and an oil, the improvement wherein said heat pump further comprises:
- an oil separator connected between a discharge side of said compressor and said four-way valve for separating said oil from said refrigerant;
- a bypass connected between said oil separator and said accumulator for transferring said separated oil to said accumulator in which said transferred oil is combined with said

refrigerant, said bypass comprising an electromagnetic valve; and

a control device comprising means for periodically opening said electromagnetic valve during operating periods of said compressor.

4,557,116

SWIMMING POOL DEHUMIDIFIER

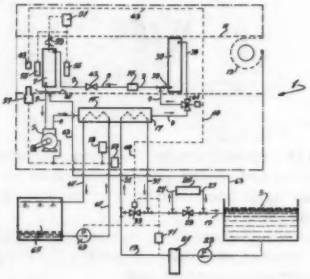
Reinhold Kittler, Hudson Heights, Canada, assignor to Dectron Inc., Montreal, Canada

Filed Mar. 5, 1980, Ser. No. 127,444

Claims priority, application Canada, Nov. 28, 1979, 340815

Int. Cl.⁴ F25B *27/02*

U.S. Cl. 62—238.6 **2 Claims**



1. A dehumidifying system for use in a building housing a swimming pool, the system comprising a refrigerant compressor, a pool water heater, an air heater, and a dehumidifying coil, means for directing refrigerant from the compressor in sequence to the pool water heater, the air heater, the dehumidifying coil, and back to the compressor; means for directing air in the building, in sequence, over the dehumidifying coil and then over the air heater, and means for circulating water from the swimming pool to the pool water heater and back to the swimming pool; said system further including means to selectively by-pass the air heater with refrigerant; means to selectively by-pass the pool water heater with pool water; means in the air directing means to selectively by-pass the dehumidifying coil with some of the air passing through the air directing means, and means for returning the moisture taken out of the air by the dehumidifying coil to the pool.

4,557,117

MACHINE FOR PRODUCING AND DISPENSING ICE-LOLLIES AND THE LIKE

Edoardo Furia, Via Volterrana 86-Loc., La Romola, San Casciano V/Pesa, Firenze, Italy 50020, and Carlo La Corte, Località Falconcello, Asciano, Siena, Italy (53041)

Filed Jul. 24, 1984, Ser. No. 633,899

Claims priority, application Italy, Jul. 26, 1983, 9485 A/83

Int. Cl.⁴ F25C *1/22;* **B65B** *5/04*

U.S. Cl. 62—340 **12 Claims**

1. An apparatus for producing moulded frozen confections and facilitating disengagement of the frozen confections therefrom, comprising:

a first mould-defining member with a first substantially concave mould surface of predetermined dimensions,

a second mould-defining member with a second substantially concave mould surface of predetermined dimensions,

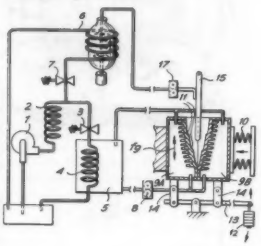
means for supporting said first and second mould-defining members in an adjacent relationship in a moulding position, at least one of said mould-defining members being movably supported,

said first mould surface being in a facing relationship with said second mould surface in said moulding position, thereby defining a mould volume of predetermined dimensions wherein each portion of said first mould surface directly opposes a portion of said second mould surface,

means for supplying a mouldable confection mix to said mould volume in said moulding position so that said confection mix is in contact with said first and second mould surfaces and assumes the shape of said mould volume in said moulding position,

means for cooling said first and second mould defining members so that said confection mix freezes and retains the shape of said mould volume in said moulding position, forming a frozen confection of well-defined dimensions in contact with said mould surfaces,

means for imparting a slight relative motion to said first and second mould-defining members mechanically coupled to



said means for movably supporting at least one of said members,

said support means, said surfaces and said means for imparting a relative motion to said mould-defining members being positioned, configured and dimensioned to cooperate so as to maintain said first and second mould surfaces in a facing relationship as said mould-defining members are relatively displaced from said moulding position during said relative motion and, upon displacement from said moulding position, to decrease the distance between at least a portion of said first mould surface and the portion of said second mould surface directly opposed thereto,

whereby said frozen confection is subjected to a compressive mechanical stress which facilitates disengagement of said frozen confection from said mould surfaces.

4,557,118

CRISPER HUMIDITY CONTROL

John J. Pink; Jeffrey L. Prunty, both of Cedar Rapids, and Donald Alba, Marengo, all of Iowa, assignors to Amana Refrigeration, Inc., Amana, Iowa

Filed Dec. 6, 1984, Ser. No. 678,917

Int. Cl.⁴ F25D *25/02*

U.S. Cl. 62—382 **15 Claims**

1. A container for providing a relatively high humidity storage region in a refrigerator compartment, comprising:

a drawer having a bottom, side walls, a back wall, and a front wall, the top of each of said side walls having a flanged lip;

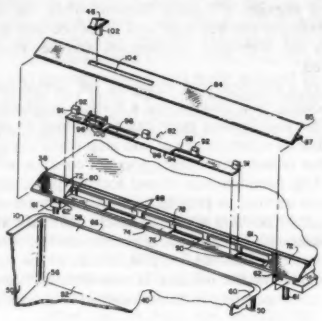
a cover adapted for mounting horizontally near the bottom of said refrigerator compartment, said cover having underside parallel slide channels for receiving said lips wherein said drawer is slidably engageable in said slide channels to a closed position underneath said cover;

said cover extending rearwardly past said back wall of said drawer in said closed position;

a continuously open passageway under said cover into the back of said container for receiving natural convection air from said refrigerator compartment in said closed position; and

said cover having a shuttered front port for providing an operator controllable front passageway from said con-

tainer wherein the amount of flow-through ventilation of said natural convection air through said container be-



tween said back and front passageways is operator adjustable.

4,557,119

CARRIAGE FOR A HAND-OPERATED SINGLE BED KNITTING MACHINE

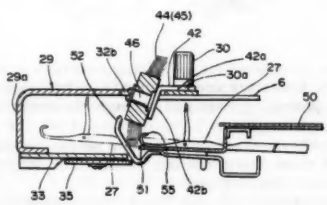
Isamu Goto, Kodaira, Japan, assignor to Silver Seiko Limited, Tokyo, Japan

Filed Apr. 30, 1984, Ser. No. 605,269

Claims priority, application Japan, May 10, 1983, 58-68489[U]

Int. Cl.⁴ D04B *7/12*

U.S. Cl. 66—60 H **4 Claims**



1. In a carriage for a hand-operated, single flat needle bed knitting machine of the type which includes a pair of main cams disposed in left and right symmetrical positions and an auxiliary cam mounted in contiguous relationship to each of said main cams for advancing a latch needle mounted in a single flat needle ed of the machine from a retracted position within said needle bed to an intermediate position in which the latch needle extends across a gap between adjacent sinker elements and a forward edge of said needle bed, the improvement which comprises a brush wheel having hairs mounted radially from an outer circumference thereof, and means for mounting said brush wheel for rotation in a plane substantially perpendicular to a longitudinal axis of the latch needle and in a position forwardly of each of said auxiliary cams in which position a lower portion thereof extends into said gap to push down a loop or loops suspended from another loop carried on a hook of the latch needle while the latch needle is advanced from said retracted to said intermediate position.

4,557,120

APPARATUS FOR WASHING FIBRE STOCK

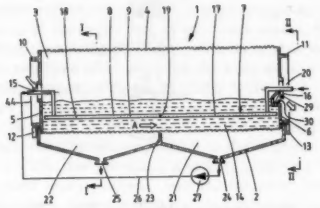
Frey Sundman, Karhula, Finland, assignor to A. Ahlstrom Osakeyhtio, Noormarkku, Finland

Filed Jun. 27, 1980, Ser. No. 163,648

Claims priority, application United Kingdom, Sep. 26, 1979, 7933408

Int. Cl.⁴ D06L *1/12*

U.S. Cl. 68—58 **3 Claims**



1. Apparatus for washing fibre stock of consistency 2–8% comprising a substantially horizontal vat (**2**), divided into a first (**21**) and a second compartment (**22**) each having an outlet opening (**24,25**), a longitudinally extending cylindrical filter screen (**3**) within the vat, at least a portion of said cylindrical screen being substantially horizontally disposed and being curved so as to be upwardly concave in cross-section, means for effecting movement of said screen portion around the axis of curvature thereof, means for supplying fibre stock into the interior of said cylindrical screen at the inlet end of said screen for passage therealong whereby the fibre stock is subjected to tumbling, means for removing the fibre stock at the opposite outlet end of said screen, and a longitudinally extending liquid supply member (**8**) fixedly mounted so as to be downwardly radially displaced from said axis of curvature, said liquid supply member being divided into a first (**17**) and a second portion (**18**) by a partition (**19**), said liquid supply member being provided with a plurality of apertures along the length thereof and introducing liquid (**20**), in the center of the stock in a region longitudinally remote from said inlet thereof, said liquid being introduced into said first portion of said liquid supply member in or adjacent the center of the tumbling, then into said cylindrical screen, said liquid flowing generally countercurrently to the direction of travel of said fibre stock, means for passing the effluent liquid into the first and second compartment of said vat and for withdrawing the effluent liquid at a location close to the stock outlet end and means for recirculating the effluent liquid (**28**) into the second portion of said liquid supply member to a location close to the inlet end of said stock.

4,557,121

ELECTRIC FAIL-SECURE/FAIL-OPEN LOCK MECHANISM

Newton W. Charlton, Thousand Oaks, Calif., assignor to Security Engineering, Inc., Forestville, Conn.

Filed Aug. 22, 1983, Ser. No. 524,907

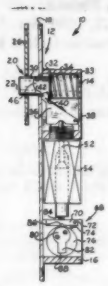
Int. Cl.⁴ E05B *47/00*

U.S. Cl. 70—279 **23 Claims**

1. In an electric door lock of the type having an elongated housing for mounting in a door or frame member, a bolt supported in said housing for movement between a projected locking position and a retracted non-locking position, means normally urging the bolt toward its projected position and a solenoid means for actuating the bolt to its retracted non-locking position, wherein the improvement comprises:

a crank lever pivotally mounted at one end within said housing for movement between first and second positions, said crank lever being operationally engageable with said bolt to push said bolt to said retracted position upon pivotal movement of said crank lever to said second position,

said solenoid means being operationally engageable with said crank lever to pivot said crank lever to said second position upon actuation of said solenoid means, and



said crank lever having a deadlatch stop portion adjacent said bolt when said bolt is in said locking position to engage and retain said bolt in a locking position to resist external driving of said bolt toward said retracted position.

4,557,122

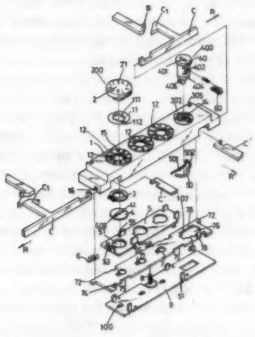
COMBINED COMBINATION AND KEY-TYPE LOCK

Blake Hwang, No. 40, Shau An St., Taipei, Taiwan

Filed Aug. 25, 1983, Ser. No. 526,286

Int. Cl.[4] E05B *37/02*

U.S. Cl. 70—312 **1 Claim**



1. A combined combination and key-type lock comprising:

a casing having a plurality of circular openings and a slotted opening;

a plurality of dials corresponding to the circular openings of said casing, each dial extending through each circular opening of said casing and having at the bottom thereof a plurality of teeth;

a fixing plate placed inside said casing, said fixing plate having a plurality of holes corresponding to the circular openings of said casing and a cross-shaped pushing rod extending downwardly from one end thereof, and spring means for urging the fixing plate towards the end of the pushing rod,

a plurality of driven discs corresponding to the holes of said fixing plate, each driven disc being mounted on one hole of said fixing plate and having a keyhole in the center, each driven disc being provided on the top with two protuberances engageable with the teeth of the dial so that said driven disc can be rotated in unison with the dial;

a locking plate located under said fixing plate, said locking plate having a plurality of holes corresponding to holes of said fixing plate, an opening aligned with the slotted opening of said casing, two tongues acting as an axis about which said locking plate may rotate, two slots each of which engages a locking element when the combined combination and key-type lock is locked and disengages when the combined combination and key-type lock is opened;

a plug of a key-type lock engaging the slotted opening of said casing, said plug having a hook, a projection, ensuring that said locking plate can be inclined to an opened position by a correct key of said plug when any one of the notches of said driven discs does not coincide with corresponding protuberance of said locking plate, said protuberance serving to prevent said plug from turning to an emergency position when the notches of said driven discs coincide with corresponding protuberances of said locking plate but allowing said plug to turn to the emergency position when the notches of said dials do not coincide with corresponding protuberances of said locking plate; and

a base plate forming the bottom of said casing, said base plate having a plurality of holes corresponding to holes of said fixing plate, a spring means being disposed between the locking plate and the base plate to urge the locking plate towards the fixing plate.

4,557,123

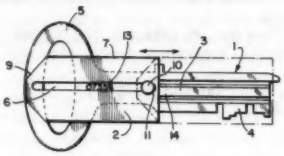
SLIDE ACTION KEY SHEILD

Arthur D. Marks, 505 Cherry St., Oxford, N.C. 27565, and Ronald L. Schultz, 1937 Buena Vista Dr., Terre Haute, Ind. 47802

Filed Jan. 16, 1984, Ser. No. 571,346

Int. Cl.[4] E05B *19/00*

U.S. Cl. 70—395 **8 Claims**



1. A slide action key shield attached to a key comprising;

a. a pin protruding from said key near the midpoint along said key's length,

b. a slidable shield means covering a part of said key, said shield means being movable by the force of gravity to cover said key part, and

c. a longitudinal slot on said slidable shield means into which said pin is inserted.

4,557,124

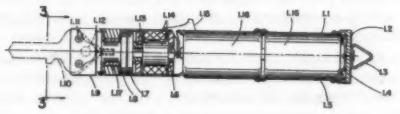
POWER KEY TURNER

Norman Russ, Box 508, Norwich, Conn. 06360

Filed May 10, 1983, Ser. No. 493,235

Int. Cl.[4] A47G *29/10*

U.S. Cl. 70—456 R **2 Claims**



1. A power key turner comprising DC motor means, a source of DC power, clutch means including a drive plate and

a driven plate, said drive plate coupled to said motor, chuck means coupled to said driven plate, said chuck means comprising a generally cylindrically shaped body rotatably supported for rotation on an axis coincident with the axis of said motor means and clutch means, said chuck means defining a forwardly open generally radially extending key slot having parallel side walls adapted to receive the head of a key therebetween, and having inclined end walls adapted to engage the edges of the key head, said chuck means further including laterally spaced threaded openings, each opening receiving a set screw engageable with the head of the key to retain the key in place.

4,557,125

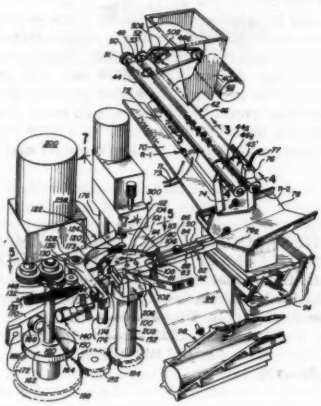
APPARATUS FOR ON LINE, RANDOM SAMPLE, INSPECTION OF COLD-FORMED BLANKS FOR THREADED FASTENERS

Theodore R. Schaumburg, Elgin, Ill., assignor to Pioneer Screw & Nut Co., Elk Grove Village, Ill.

Filed Jun. 20, 1984, Ser. No. 622,752

Int. Cl.[4] B21B *37/00*

U.S. Cl. 72—12 **11 Claims**



1. In an assaying apparatus for determining the acceptability to pre-selected specifications of each blank of a continuous output of individual, cold-formed intermediate blanks for fasteners and the like from a cold-forming machine, each blank including an axially elongated stem with a work-entering end and a head end, the head end of the stem being formed integrally with a head section that is of greater maximum transverse dimension than the transverse dimension of the elongated stem, the head section having means adapted to be engaged by a driving tool for rotating the finished fastener;

the improvement in the assaying apparatus comprising, in combination:

first assaying means for preliminarily assaying each blank of the continuous output of blanks, to provide a continuous output of first assayed blanks having maximum transverse dimension of the respective head sections within a preselected first dimensional range, by rejecting blanks having head sections with dimensions outside of said range, said minimum dimension of said range being greater than the maximum transverse dimension of a stem;

means operatively connected to said first assaying means and the cold-forming machine for automatically terminating the output of blanks from the cold-forming machine when said first assaying means rejects a blank;

selection means operatively connected to said first assaying means to select random samples of first assayed blanks;

said selection means including an elongated track means with an inlet end and outlet end, operatively constructed to provide a vertical slot bounded by a pair of spaced support rails along which move, in single file, the random samples of first assayed blanks, the stems of the sample blanks passing through and along said vertical slot from inlet end to outlet end with the respective head section of each sample blank being supported upon and sliding along the upper surfaces of the pair of support rails;

a rotatable table located adjacent the outlet end of said elongated track means, and having a blank receiving and holding recess therein adapted to be alignable with the outlet end of the elongated track means to receive the blank at the outlet end of said track means, the received blank then being positioned with its stem in said recess of the rotatable table, and with the head section of the blank being supported by the rotatable table;

means for rotating the rotatable table with the aforesaid blank in said recess thereof to a second assay position;

second assay means, responsive to the rotation of the rotatable table, for providing a second assay of a blank in the second assay position, said second assay comprising at least two measurements of characteristics of the blank head section other than the measurement made in the first assay, to determine whether said at least two measurements fall within respective predetermined dimensional ranges; and

means for terminating the output of blanks when any one of said at least two measurements fails to fall within said respective predetermined dimensional range.

4,557,126

CONTROL DEVICE FOR CONTINUOUS ROLLING MACHINE

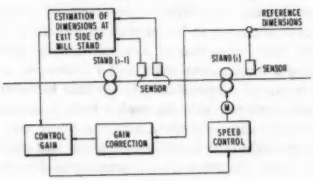
Shuhei Niino; Koichi Ishimura; Ken Okamoto, and Koichi Ohba, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 29, 1982, Ser. No. 427,339

Claims priority, application Japan, Sep. 30, 1981, 56-157214; Sep. 30, 1981, 56-157215

Int. Cl.[4] B21B *37/12*

U.S. Cl. 72—16 **1 Claim**



1. A control device for a continuous rolling machine, comprising; dimension detection means for detecting the dimension of a material at the exit of a mill stand, forecasting means receiving a difference between a dimension of the material as detected by said dimension detection means and a reference material dimension at the exit of said mill stand for forecasting a change in the lateral dimension of the material at the exit of an ith mill stand situated downstream of said mill stand, first control means for controlling the tension on the material between an i-1th mill stand and the ith mill stand so that said change in the lateral dimension forecast by said forecasting means is reduced to zero, lateral dimension detection means disposed at the exit of the ith mill stand for detecting the actual lateral dimension bi of the material at the exit of said ith mill stand, second control means receiving the difference between the actual lateral dimension as detected by said lateral dimension detection means and a reference lateral dimension bREF at the exit of said ith mill stand for further controlling the tension on the material between the ith and i-1th mill stands so that said difference is reduced by zero; said first control means

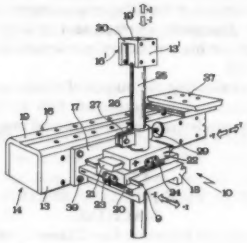
comprising speed correction means (15-2) responsive to said forecast change for producing a feed-forward speed control signal (ΔV_{FF}); said second control means comprising additional speed correction means (17-2) responsive to said difference between said actual lateral dimension and said reference lateral dimension to produce a feed-back speed control signal (ΔV_{FB}); and speed control means (29), responsive to said feed-forward signal and to said feed-back signal, for controlling the speed of said ith mill stand and controlling said tension to reduce to zero both said forecast change and said difference between said actual lateral dimension and said reference lateral dimension.

4,557,127

MOTOR VEHICLE BODY REPAIR BENCH

Giuseppe Pietrelli, Via San Leonardo n. 434, Massa, Italy

Filed Jun. 24, 1983, Ser. No. 508,057
Claims priority, application Italy, Feb. 28, 1983, 67225 A/83
Int. Cl.⁴ B21D *1/14*
U.S. Cl. 72—34 **3 Claims**



1. A motor vehicle body repair bench having standard jig supports and a structure comprising a pair of parallel longitudinal members to which crossbeams with perforated side and upper surfaces are secured, characterized in that each of said standard jig supports is removably mounted on said crossbeams and comprises:

a cross-shaped horizontal slide assembly supported by a bracket arranged to be secured to a surface of said crossbeam, said cross-shaped horizontal slide assembly comprising a longitudinal slide and a transverse slide;

a rod mounted perpendicularly on said horizontal slide assembly, and movable through a hole in said cross shaped horizontal slide assembly, said rod being also movable in unison with said longitudinal slide and said transverse slide in the longitudinal and transverse directions, respectively; and

a member of inverted U-shape having three perforated surfaces having the same orientation of said perforated surfaces of said crossbeam, provided at the upper end of said movable rod, to reproduce said perforated surfaces of said crossbeam in a position close to a damaged motor vehicle body to be repaired or checked; said member of inverted U-shape being arranged to receive jigs for engaging and/or checking portions of the damaged vehicle body.

4,557,128

APPARATUS FOR PRODUCING A BULGE IN THIN METAL MATERIAL

John J. Costabile, 7037 E. Moreland, Scottsdale, Ariz. 85257

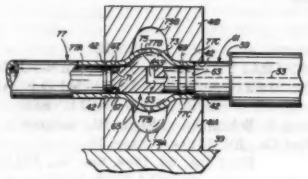
Division of Ser. No. 343,280, Jan. 27, 1982, Pat. No. 4,513,598.
This application Apr. 19, 1985, Ser. No. 725,306
Int. Cl.⁴ B26D *26/02*
U.S. Cl. 72—62 **8 Claims**

1. An apparatus for forming a bulge in a first portion of a piece of relatively thin metal, said apparatus comprising in combination:

(a) a die having a cavity therein and a first surface adjacent said cavity;

(b) means for abutting a second portion of said piece of metal against said first surface of said die, said first portion of said piece of metal being adjacent to said second portion of said second piece of metal and being positioned in generally aligned relationship with said cavity;

(c) means for applying a predetermined amount of pressure by means of pressurized fluid on said piece of metal on a surface thereof opposed to said cavity in order to cause an



initial bulging of said first portion of said piece of metal into said cavity; and

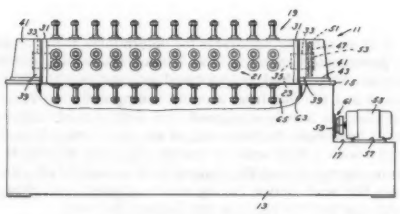
(d) means for applying a transverse force to said piece of metal while said fluid pressure is applied thereto in order to force some of said second portion of said piece of metal to slide into said cavity to allow said fluid pressure to cause further bulging of said piece of metal into said cavity without excessive thinning of said piece of metal, said transverse force being transverse to a force produced on said first portion of said piece of metal by said fluid pressure.

4,557,129

MULTIPLE TOOLING ROLL FORMING MACHINE WITH TURRET TYPE ROTARY MOTION

Edward G. Lash, Huntington Woods; Roger Levy, Oak Park, and Charles J. Nickels, Southgate, all of Mich., assignors to Tishken Products Co., Detroit, Mich.

Filed Sep. 4, 1984, Ser. No. 646,972
Int. Cl.⁴ B21D *5/08*
U.S. Cl. 72—176 **23 Claims**



1. In a roll forming machine having a base, a top plate on the base, a motor drive, a gear drive transmission connected to the motor drive and a plurality of vertically aligned power rotated longitudinally spaced pairs of complimental forming rolls arranged in a longitudinal set to successively receive therebetween an elongated strip of stock in a continuous operation, and gear means interconnecting said transmission and forming rolls for rotation thereof in unison;

the improvement comprising a turret mount assembly supporting a plurality of radially extending preset sets of form roll tooling, each set being adapted for different form of product, one of said sets having a horizontal outwardly directed operational position, said turret assembly adapted for selected limited rotation upon a longitudinal axis to rapidly place any one of said plurality of preset sets in operational position;

said turret mount assembly including a pair of aligned outwardly directed trunnion shafts located upon said axis;

a pair of apertured upright end supports secured upon said top plate receiving said trunnion shafts; and

rotatable gear means on one end support and one trunnion shaft for rotating said turret mount assembly and one of said sets of tooling to operational position.

4,557,130

HOUSINGLESS BEAM MILL STAND

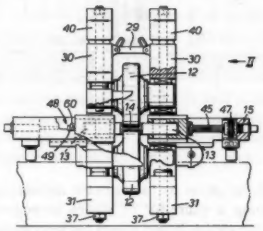
Harry L. F. Bond, Hathersage Nr. Sheffield, England, assignor to Davy McKee (Sheffield) Limited, Yorkshire, England

Filed Aug. 25, 1983, Ser. No. 526,169

Claims priority, application United Kingdom, Aug. 25, 1982, 824445; Oct. 29, 1982, 8231034; Mar. 22, 1983, 8307822

Int. Cl.⁴ B21B *13/10, 31/04, 31/24, 31/08*

U.S. Cl. 72—225 **10 Claims**



1. A housingless beam mill stand comprising: a frame of substantially rectangular form and including a central space defined by the frame, upper and lower chocks for upper and lower horizontal rolls located on opposite sides of the frame; roll gap adjustment means mounted in or on the frame, said roll gap adjustment means being infinitely variable between defined limits and acting effectively between the frame and the horizontal roll chocks; prestressing tension bolts acting between upper and lower horizontal roll chocks and passing through the space defined by the frame, whereby the adjustment means are preloaded; a pair of cooperating and opposed vertical rolls; and two chocks in which the respective vertical rolls are journalled, said vertical roll chocks being adjustably mounted on the frame to permit variation of the vertical roll gap, and having through passages elongated in one direction, said tension bolts passing through said passages while permitting adjustment movement of the vertical roll chocks lengthwise of the frame.

4,557,131

DEVICE FOR INDIRECT EXTRUSION OF A HOLLOW SECTION

Alfred Wagner, Steisslingen, and Adolf Ames, Duchtlingen, both of Fed. Rep. of Germany, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

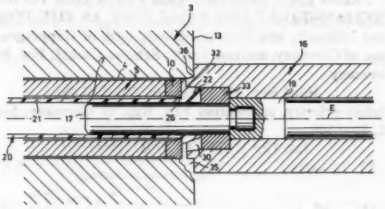
Filed Dec. 20, 1983, Ser. No. 563,309

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1982, 8236460[U]

Int. Cl.⁴ B21C *25/00, 26/00*

U.S. Cl. 72—273 **5 Claims**

1. Device for indirect extrusion of a hollow section having an extruded integral flange thereon that projects out beyond the side of the hollow section from a hollow billet which comprises: a die for extruding said billet, said die having a die face; a shape-giving orifice of said die which determines the outer contour of said section; a container movable with respect to said die enclosing the die; an extrusion ram and a single column-like mandrel projecting therefrom and operatively associated with said die and said orifice, said mandrel determines the inner contour of the hollow section and said extrusion ram having an extrusion ram face directed towards said die face; a shaping recess which determines the extruded integral flange provided immediately in front of said shape-giving orifice of the die with respect to the extrusion direction x, the radial dimension of said recess being greater than the width of



the shape-giving orifice, wherein the recess is provided in the extrusion ram face running counter to the extrusion direction x and wherein the recess is formed by a ring-shaped collar and an insert defining the base of the recess and the shape of the flange.

4,557,132

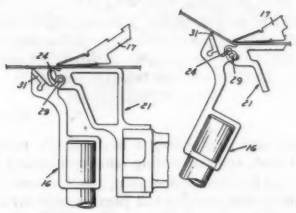
SHEET BENDING BRAKE

Douglas G. Break, Dearborn, Mich., assignor to Tapco Products Company, Inc., Detroit, Mich.

Filed Feb. 3, 1984, Ser. No. 576,870

Int. Cl.⁴ B21D *5/04*

U.S. Cl. 72—319 **32 Claims**



1. A sheet bending brake comprising

a first longitudinally extending member having a clamping surface,

means movable toward and away from the clamping surface for holding a workpiece in position for bending,

a second member for bending a workpiece clamped on said clamping surface extending longitudinally with respect to said first member,

each of said first and second members having substantially the entire length of the longitudinal edges thereof formed with longitudinally spaced intermeshing integral projections,

the projections on said second member having a plurality of aligned openings,

the projections on said first member having a plurality of aligned openings comprising slots extending axially with respect to the longitudinal axis of said member,

a hinge pin extending through said openings of said second member and said slots of said first member,

said second member having a fixed workpiece contacting portion spaced from the projections, said workpiece contact surface being fixed relative to said hinge pin,

said slots having a configuration such that as the second member is moved relative to said first member to bend a workpiece, the hinge pin is guided along said slots such that the contacting portion of said second member remains

substantially in the same position relative to the workpiece during the bending operation.

4,557,133

PRESS UNIT HAVING GRIPPER RAILS TO BE EXCHANGED AT THE SAME TIME AS THE TOOLS

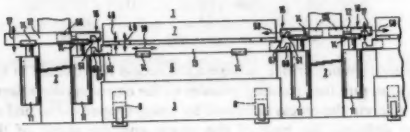
Gerald Mikusch, and Werner Münch, both of Göppingen, Fed. Rep. of Germany, assignors to L. Schuler GmbH, Fed. Rep. of Germany

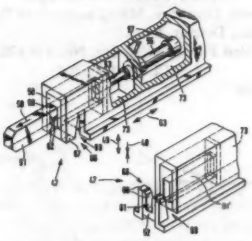
Filed Sep. 19, 1983, Ser. No. 533,453

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1982, 3235308

Int. Cl.⁴ B21J *13/08*; B21D *43/10*

U.S. Cl. 72—405 **5 Claims**





5. A press unit comprising a multiple die press having a plurality of tools and one sliding table comprising at least one platen that can be fixed in operating position, said sliding table being positioned adjacent fixed press stands with said table being movable relative to said press stands for a tool change and gripper bars that can be adjusted in time with the slide movement for the transfer of workpieces from one processing station to the next comprising

first gripper bar sections mounted on the press stands and

second gripper bar sections mounted on the sliding table and being movable vertically away from the first gripper bars by means of the sliding table,

coupling means for coupling and uncoupling the first and second gripper bar sections one from another by means of a movement taking place vertically,

a drive control means comprising a fixing member for locking the coupling means at least during the operation of the press and for unlocking the coupling means for a tool change, the drive control means and the fixing member to be moved by the drive control means being inserted inside a hollow space of the first gripper bar section mounted on the press stand,

the longitudinal dimensions of the drive control means and fixing member being disposed in a longitudinal position of the first gripper bar section,

a counter part positioned in a hollow space of the second gripper bar section movable with the sliding table and the fixing member in response to the drive control means positioned into the hollow space of the first gripper bar section mounted on the press stand after the coupling of the first and second gripper bar sections can be slid into the counter part and before the uncoupling of the first and second gripper bar sections by means of the drive control means can be removed from the counter part.

4,557,134

APPARATUS FOR SUPPORTING WORKPIECES IN A MULTISTAGE PRESS

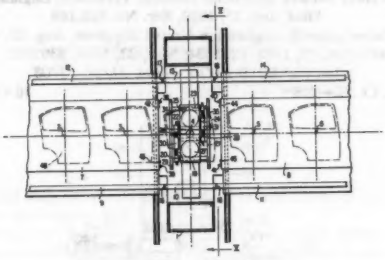
Günter Kuppinger, Baindt, Fed. Rep. of Germany, assignor to Maschinenfabrik Müller-Weingarten AG, Weingarten, Fed. Rep. of Germany

Filed Sep. 21, 1984, Ser. No. 653,078

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1983, 3334021

Int. Cl.⁴ B30B *15/30*; B21D *43/05*

U.S. Cl. 72—405 **4 Claims**



1. In a transfer press for a stepwise deformation of workpieces, including a plurality of stages arranged in a series; means extending through said stages for intermittently advancing the workpieces from one stage to a successive stage; some of said stages being work stages for deforming the workpieces by workpiece-deforming means; at least one of said stages being an empty stage void of workpiece-deforming means; workpiece-supporting means arranged in said empty stage for supporting a workpiece while the workpiece dwells in said empty stage; and a tool-supporting table normally situated in a work stage in a working position adjacent said empty stage and displaceably mounted for effecting tool replacement thereon; the improvement wherein said workpiece-supporting means comprises

(a) a workpiece-supporting element;

(b) securing means readily releasably mounting said workpiece-supporting element at least indirectly on said table for temporarily positioning said workpiece-supporting element; and

(c) gripping and holding means installed in said empty stage for grasping said workpiece-supporting element, removing said workpiece-supporting element from said table, moving said workpiece-supporting element into a workpiece-supporting working position in said empty stage and holding said workpiece-supporting element in its said working position.

4,557,135

DEVICE FOR MANIPULATING WORKPIECES

Christian Ragettli, Gockenhausen, and Theo Frei, Zofingen, both of Switzerland, assignors to Haemmerle AG, Zofingen, Switzerland

Filed Dec. 27, 1983, Ser. No. 565,769

Claims priority, application Switzerland, Jan. 6, 1983, 63/83

Int. Cl.⁴ B21D *43/10, 43/11*

U.S. Cl. 72—420 **22 Claims**

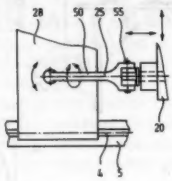
1. A device for manipulating workpieces in a press, especially for manipulating sheets or panels in and around the operating region of a tool of a forming or shearing press, comprising:

at least one lateral transport carriage movable in a substantially horizontal direction substantially parallel to an operating plane of the tool of the press;

at least one longitudinal transport carriage mounted on said at least one lateral transport carriage and movable in a

substantially horizontal direction substantially perpendicular to the operating plane of the tool of the press;

at least one gripping jaw carriage mounted on said at least one longitudinal transport carriage and movable in a substantially vertical direction substantially parallel to said operating plane of the tool of the press;



at least one gripping jaw means movably mounted on said at least one gripping jaw carriage for supporting and manipulating a workpiece; and

at least one turning means mounted in said at least one gripping jaw means and disposed to act in a plane substantially coincident with the plane of the workpiece for rotating the workpiece substantially in its own plane.

4,557,136

VALVE TESTING

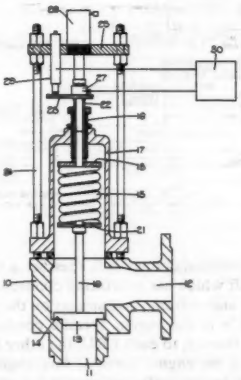
Edward J. Greenhalf, Wellington, England, assignor to Greenwood Moore Limited, Shropshire, England

Filed Aug. 8, 1984, Ser. No. 638,775

Claims priority application United Kingdom, Aug. 12, 1983, 8321751

Int. Cl.⁴ G01L *27/00*

U.S. Cl. 73—4 R **10 Claims**



1. A method of testing a relief or safety valve of the type which includes a valve member, urged into engagement with a seat by biassing means, and an adjustment member by means of which the urging force exerted on the valve member by the biassing means can be adjusted, the method including the steps of applying a force to an end of the biassing means where the latter is operatively connected to the adjustment member, in a manner to continue to urge the valve member into engagement with the seat, and measuring the force thus applied at the moment when said force is just sufficient to disengage the operative connection between the biassing means and the adjustment member.

4,557,137

PHOTOACOUSTIC ANALYZER

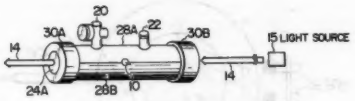
Takehiko Kitamori, Hitachi; Masaaki Fujii, Katsuta, and Tsuguo Sawada, Kodaira, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 7, 1983, Ser. No. 530,061

Claims priority, application Japan, Sep. 10, 1982, 57-158547

Int. Cl.⁴ G01N *21/00*

U.S. Cl. 73—24 **3 Claims**



1. A photoacoustic analyzer comprising an analyzing cell having a beam entrance window and including a cylindrical piezoelectric transducer element forming at least a part of the wall thereof, and beam emitting means emitting a light beam directed toward and into said analyzing cell through said beam entrance window, wherein the ratio r/r_o between the radius r of the inner side of said analyzing cell and the radius r_o of said incident light beam is selected to lie within the range of $1 \leqq r/r_o \leqq 8$.

4,557,138

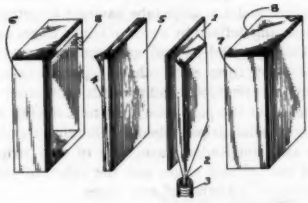
LARGE-SCALE COLD CUP APPARATUS FOR VAPOR BARRIERS RESISTANCE (PERMEANCE) TESTING

Eugene J. Dumitriu-Valcea, and Mariana Dumitriu-Valcea, both of 961 Santa Maria Drive, Greenwood, Ind. 46142

Filed Jun. 6, 1984, Ser. No. 617,982

Int. Cl.⁴ G01N *15/08*

U.S. Cl. 73—38 **2 Claims**



1. A "large-scale cold cup testing apparatus" for determination of vapor barriers permeability resistance of permeance in similar conditions as the service conditions especially in relation with temperature and relative humidity gradient, including the combination of:

a large scale cold cup device for collecting the permeated water vapor flow through vapor barrier systems,

large-scale specimens of vapor barrier and support plate assembly, realized in real installation conditions, tightly sealed on the cold cup,

two controlled atmosphere chambers:

a warm chamber with interior temperature and relative humidity as in real conditions, sealed to the vapor barrier and support plate assembly,

another cold chamber with exterior air temperature and relative humidity conditions, sealed to the cold cup device,

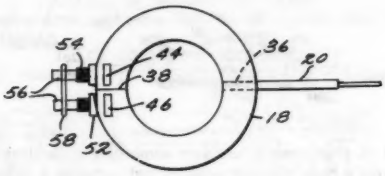
air and surface temperature and air relative humidity and material moisture content-measurement devices.

4,557,139

LEAK DETECTION METHOD AND APPARATUS

Thomas Cantwell, Houston; William Simon, Alice, and Bobby Young, Pasadena, all of Tex., assignors to Loomis International Inc., Pasadena, Tex.

Filed Jul. 31, 1984, Ser. No. 636,276
Int. Cl.[4] G01M *3/20, 3/22*
U.S. Cl. 73—40.7 12 Claims



1. A leak detection apparatus for a pipe coupling joint comprising:

means insertable into a pipe and locatable astride a joint, said insertable means including a pair of spaced apart means for engaging the inner surface of the pipes being coupled and conduit means for feeding a gas into a first volumn defined by said pair of engaging means and the portion of the interior of the pipes extending between said pair of engaging means with said first volumn including at least one pipe joint,

deformable sleeve means having slot means permitting said sleeve means to be disposed about the exterior surface of a pipe joint to define a second volumn between the interior of said sleeve means and the site of the joint externally thereof, with the interior of said sleeve means being shaped so as to limit said second volume to a capacity of between 5 cc and 300 cc, said sleeve means including passage means for establishing communication between said second volume and means for detecting the presence of a gas in said second volumn, said sleeve means comprising a resiliently deformable tube having a longitudinal axis and an opening defined by a pair of facing edges extending substantially parallel to said axis with said edges being movable away from each other to permit said tube to placed about a pipe joint and towards each other to close said tube about the pipe joint, said tube having a pair of reinforcing metal strips embedded therein extending parallel to said longitudinal axis, one of said strips being adjacent one of said edges and the other of said strips being adjacent the other of said edges.

4,557,140

HORSEPOWER AND FUEL CONSUMPTION GAUGE

Douglas F. McFarland, Davis City, Iowa 50068

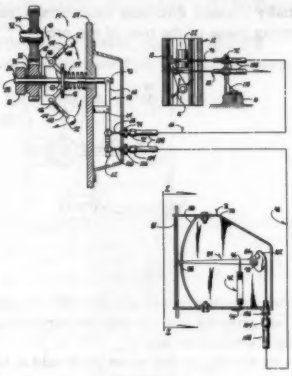
Filed Nov. 23, 1983, Ser. No. 554,614
Int. Cl.[4] G01M *15/00*
U.S. Cl. 73—114 17 Claims

1. A gauge for determining industrial diesel engine horsepower performance at varying load conditions and at a constant full throttle speed said engine having a throttle system and an external governor having an arm means connected to said throttle system for maintaining a constant speed, comprising:

a gauge housing,

a calibrated facing mounted within said housing, and

an indicator means pivotally mounted within said housing and operatively connected to said governor arm so as to be mechanically responsive to movement of the governor



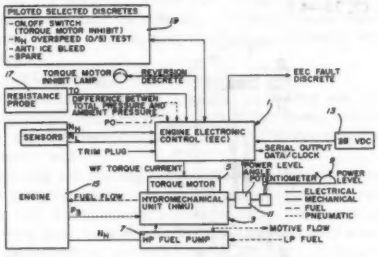
arm for continuously indicating on said calibrated facing the horsepower being developed by said engine.

4,557,141

METHOD FOR DIAGNOSING FAULTS IN ELECTRONIC FUEL CONTROL SYSTEMS

Roger Poirier, Ormeaux, and Donald F. Hamill, St. Laurent, both of Canada, assignors to Pratt & Whitney Canada Inc., Longueuil, Quebec, Canada

Filed Sep. 19, 1984, Ser. No. 652,016
Int. Cl.[4] G01M *15/00*
U.S. Cl. 73—117.2 4 Claims



1. A method of troubleshooting, with a test set, a fuel control system in an aircraft which has interfacing connectors with an engine on one side and airframe instruments on the other side, a plurality of LRU's in the engine, specific conductors connected, at one end thereof, to each LRU, the other end of said conductors forming an engine harness, said engine harness being split into an engine/airframe interface portion whose connectors are connected to separate positions of a multiposition interface plug, a mating multiposition interface receptacle being connected to said multiposition interface plug to airframe instruments;

said fuel control system comprising an electronic engine control (EEC);

said engine harness being further split into an EEC harness portion connected to a separate position of a multiposition EEC plug connected to a mating multiposition EEC receptacle mounted on said EEC;

a trim plug mounted on a mating trim plug receptacle on said EEC;

said test set comprising a first harness, respective connectors

of said first harness being connected to a first test receptacle for mating engagement with said multiposition bulkhead plug, and other connectors of said first harness being connected to a first test plug for mating engagement with said mating multiposition bulkhead receptacle;

said test set further comprising a second harness, respective connectors of said second harness being connected to a second test receptacle for mating engagement with said multiposition EEC plug, and other connectors of said second harness being connected to a second test plug for mating engagement with said mating trim plug receptacle;

said method comprising:

disconnecting the mating multiposition bulkhead receptacle from said multiposition bulkhead plug and connecting said first test receptacle to said multiposition bulkhead plug and said first test plug to said mating multiposition bulkhead receptacle;

disconnecting said multiposition EEC plug from said mating multiposition EEC receptacle and connecting said second test receptacle to said multiposition EEC plug;

connecting said second test plug to said mating trim plug receptacle;

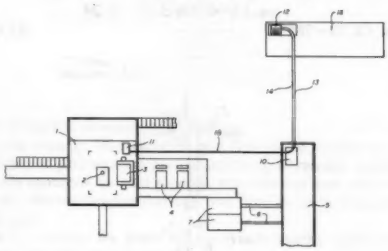
testing the circuits of said fuel control system one at a time by sending signals from said test set through said connectors of said first and second harness one at a time and receiving signals to determine if a fault exists in the respective circuits.

4,557,142

APPARATUS AND METHOD FOR REAL-TIME MEASUREMENT OF DRILLING FLUID PROPERTIES

Gary L. Hensley, Houston; Jan Van Dokkum, Crosby, both of Tex.; Adrianus Groeneweg, Dordrecht, and Gerritt Stolk, Lage Swaluwe, both of Netherlands, assignors to Hutchinson-Hayes International, Inc., Channelview, Tex.

Filed Oct. 13, 1983, Ser. No. 541,725
Int. Cl.[4] E21B *47/00*
U.S. Cl. 73—153 **40 Claims**



30. Apparatus for measuring viscosity properties of both Newtonian and non-Newtonian fluids comprising:

a vertical cylindrical housing at the lower end of which is a cylindrical fluid chamber having an inlet through which fluids may be received therein;

a cylindrical bob centrally disposed in said fluid chamber depending from a rotatable bob shaft;

motor means supported by said housing and connected to said bob shaft by magnetic coupling means for rotation of said bob; and

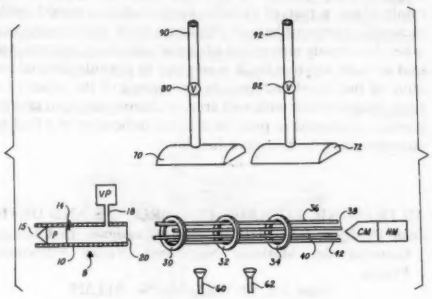
indicator means carried by said housing and responsive to torque applied to said bob shaft for producing signals indicative of certain viscosity indices of fluids resident in said fluid chamber, including yield point, plastic viscosity and gel strength.

4,557,143

LAUNCH SETBACK SIMULATOR

Irvin Pollin, 6600 Michaels Dr., Bethesda, Md. 20817

Filed Nov. 18, 1983, Ser. No. 553,273
Int. Cl.[4] G01L *5/14*; G01M *7/00*
U.S. Cl. 73—167 **17 Claims**



1. Apparatus to simulate a portion of a launch setback experienced by an ordance projectile comprising:

a. means for accelerating said projectile to a high speed;

b. a rainfield generator means to generate a density field of water droplets in a guide path of said projectile; and

c. means on the rainfield generator means for varying the density of said field of water droplets as a function of the distance travelled by said projectile through said field of water droplets;

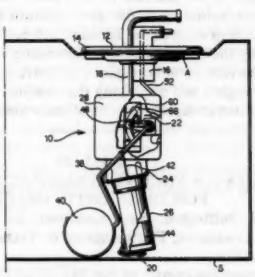
whereby the momentum exchange between said projectile and said field of water droplets retards the motion of said projectile in a prescribed way resulting in the simulation of a portion of the launch setback.

4,557,144

ELECTRIC LEVEL SENSOR FOR MOTOR VEHICLE FUEL TANKS

Giuseppe Lucchini, Turin, Italy, assignor to Fiat Auto S.p.A., Italy

Filed Jul. 8, 1983, Ser. No. 512,049
Claims priority, application Italy, Sep. 27, 1982, 53724/82[U]
Int. Cl.[4] G01F *23/10*
U.S. Cl. 73—313 **14 Claims**



1. An electric level sensor for motor vehicle fuel tanks comprising support means adapted to be mounted within a fuel tank, an arm carried by said support means for pivotal movement about a pivot axis, float means carried on one end of said arm, a potentiometer including a ceramic plate carried by said support means, an arcuate resistive track deposited on said ceramic plate concentric with said pivot axis, an arcuate dummy track concentric to and spaced from said arcuate resis-

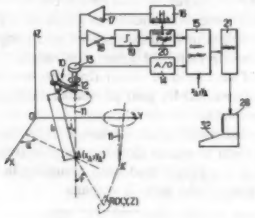
tive track and having a length shorter than said arcuate resistive track, a fixed contact comprised of an electrically conductive area formed on said ceramic plate in radially spaced relation to one end of said arcuate resistive track in arcuate alignment with said arcuate dummy track, a resilient moveable contact blade mounted for rotation with said pivoted arm and disposed radially relative to said pivot axis adjacent said ceramic plate, a pair of radially aligned studs on said resilient moveable contact blade in alignment with said arcuate tracks whereby arcuate movement of one of said studs in contact with said arcuate resistive track is adapted to provide a signal indicative of fuel level and arcuate movement of the other of said studs from contact with said arcuate dummy track to said fixed contact is adapted to provide a signal indicative of a fuel level corresponding to a reserve fuel level.

4,557,145

ULTRASONIC ECHOGRAPHY PROCESS AND DEVICE

Jean Perdijon, Saint Ismier, France, assignor to Compagnie Generale des Matieres Nucleaires, Velizy Villacoublay, France

Filed Jul. 13, 1983, Ser. No. 513,329
Claims priority, application France, Jul. 13, 1982, 82 12299
Int. Cl.⁴ G01N *29/04*
U.S. Cl. 73—621 **6 Claims**



1. A process for echographic detection of ultrasound reflecting zones in a piece, including the steps of: directing successive fine ultrasonic beam pulses from a transducer into said piece across a surface of said piece along a plurality of different genatrix lines of a plurality of successive zones each having a rotational symmetry about an axis orthogonal to said surface, and whose apexes are on said surface and with a constant path length from said transducer to said surface, while providing translational movement of said transducer such that each zone in a region to be scanned in said piece receives at least two pulses corresponding to different azimuth angles; determining the location of each of the zones which provide an echo signal; combining the echo signals corresponding to each of said zones which provide an echo signal and corresponding to different azimuth angles; and displaying the combination of echo signals on an isometric representation of each piece.

4,557,146

SELECTABLE FOCUS ULTRASONIC TRANSDUCERS FOR DIAGNOSTIC IMAGING

Ralph M. Buffington; Perry Kaminski, and Eugene A. Larson, all of Lewistown, Pa., assignors to Technicare Corporation, Solon, Ohio

Continuation-in-part of Ser. No. 400,547, Jul. 21, 1982, abandoned. This application Jan. 13, 1984, Ser. No. 570,702
Claims priority, application European Pat. Off., Jul. 20, 1983, 83304222.9
Int. Cl.⁴ G01N *29/00*
U.S. Cl. 73—642 **11 Claims**

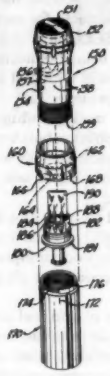
1. A dual aperture ultrasonic transducer probe assembly for an ultrasonic diagnostic system comprising:

a housing having an electrically shielded interior space;

a dual aperture transducer having first and second electrically separate regions, said transducer being located at one end of said housing;

means, located in a wall of said housing, for making an electrical connection between said interior space and the exterior of said housing;

a reed switch, located in said shielded interior space, and



connected to said first and second transducer regions and said electrical connection means for selectively coupling said region to said connection means; and

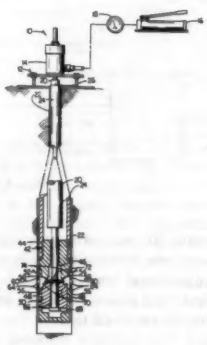
a magnet located external to said shielded interior space and movably mounted so as to selectively open and close said reed switch for varying the coupling of said transducer regions to said electrical connection means.

4,557,147

BORE HOLE ROCK SHEAR TESTER AND METHOD FOR USING SAME

John R. Rohde, Ames, and John M. Pitt, Nevada, both of Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed May 14, 1984, Ser. No. 609,967
Int. Cl.⁴ G01N *3/24, 33/24*
U.S. Cl. 73—784 **12 Claims**



9. A method for making a rock bore hole test in a rock bore hole having cylindrical rock walls, said method comprising:

inserting a pair of wedge members into said hole, said wedge members each comprising a rock engaging surface facing radially outwardly from the vertical axis of said hole, each of said rock engaging surfaces including teeth for engaging said rock walls;

spreading said wedge members radially outwardly in oppo-

site directions until said teeth engage and partially embed themselves within said rock wall;

simultaneously exerting an upward axial force and an outward radial force to said wedge members,

increasing the magnitude of said axial and radial forces until the axial force causes said teeth of said wedge members to shear said rock walls of said bore hole;

registering the magnitude of said axial and radial forces at the time of said shearing;

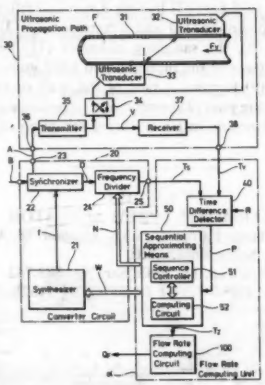
said simultaneous exertion of said upward axial and outward radial forces being accomplished by pulling upwardly on a rod having a drive block attached thereto, said drive block having a tapered cam surface which engages a complimentary tapered surface on each of said wedge members, said tapered surfaces camming against one another during said upward pulling of said rod and causing both of said upward axial force and said outward radial force to be exerted on said wedge members.

4,557,148

ULTRASONIC FLOWMETER

Chuji Akiyama, Tokyo, Japan, assignor to Yokogawa Hokushin Electric Corporation, Tokyo, Japan

Filed Apr. 16, 1984, Ser. No. 601,051
Claims priority, application Japan, Apr. 21, 1983, 58-70600
Int. Cl.[4] G01F *1/66*
U.S. Cl. 73—861.28 **4 Claims**



1. An ultrasonic flowmeter comprising

a pipe for passage therethrough of a fluid to be measured;

an ultrasonic propagation path comprising ultrasonic transducers mounted on said pipe for transmitting and receiving an ultrasonic wave through said fluid flowing through said pipe;

a signal generator for generating a synchronizing signal to drive said ultrasonic transducers;

a flow rate computing unit for computing flow rate of said fluid in response to a reception time signal from said ultrasonic propagation path;

said signal generator comprising a converter circuit responsive to a control signal from said flow rate computing unit, for supplying said synchronizing signal and a frequency division time signal synchronously with said synchronizing signal; and

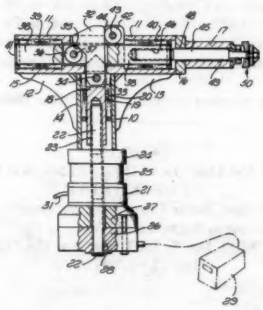
said flow rate computing unit comprising a time difference detector, supplied with said frequency division time signal from said signal generator and said reception time signal from said ultrasonic propagation path, for detecting a time difference between said supplied signals, and sequential approximating means responsive to an output signal from said time difference detector for supplying said control signal to cause said frequency division time signal to approach said reception time signal in sequential approximation.

4,557,149

PORTABLE 90 DEGREE PROOF LOADING DEVICE

Richard G. Bird, Torrance, and Leo A. Berson, Pico Rivera, both of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics & Space Administration, Washington, D.C.

Filed May 3, 1983, Ser. No. 491,113
Int. Cl.[4] G01L *5/00*
U.S. Cl. 73—862.54 **14 Claims**



1. A device for proof loading of bearings and the like, comprising: a generally tee-shaped tubular housing having column and cross-arm portions, externally firmly attached to each other; a first thrust rod within said housing column portion and low friction support means associated therewith, said first thrust rod and low friction support means being positioned and arranged so as to permit low frictional, longitudinal translation of said first rod; a second thrust rod within said housing cross-arm portion and low friction support means associated therewith, said second thrust rod and low friction support means being positioned and arranged so as to permit low frictional, longitudinal translation of said second rod, said second rod projecting from an end of said cross-arm housing portion; a cam attached to one end of said first thrust rod substantially at the junction of said column and cross-arm housing portions and a cam follower attached to said second thrust rod, said cam having an angled surface in contact with said cam follower such that a pulling force applied to a second end of said first rod produces a pulling force tending to draw said thrust rod into said cross-arm housing portion; fluid operated means for applying said pulling force to said first rod and load cell and display means for measuring and displaying the magnitude of said first rod pulling force; and a pair of interchangeable interface parts cooperating with said second thrust rod with one of said parts being mounted on the projecting end of said second thrust rod, one of which has a force application surface having a greater diameter than the diameter of the other part having a force application surface.

4,557,150

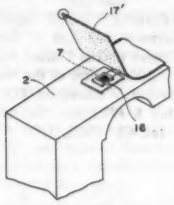
LOAD CELL

Mitito Utsunomiya, Kusatsu, Japan, assignor to Kabushiki Kaisha Ishida Koki Seisakusho, Kyoto, Japan

Filed Oct. 26, 1983, Ser. No. 545,473
Claims priority, application Japan, Oct. 26, 1982, 57-187744; Oct. 26, 1982, 57-161840[U]; Nov. 10, 1982, 57-198259
Int. Cl.[4] G01L *1/22*
U.S. Cl. 73—862.65 **8 Claims**

6. A load cell comprising:

a load-sensitive element having a portion reduced in thickness for providing flexibility;
a strain gauge affixed to said reduced-thickness portion;



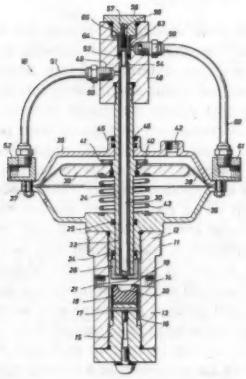
a Teflon sheet covering said strain gauge non-adhesively; and
a covering member covering said Teflon sheet.

4,557,151

SAMPLER INCORPORATING PRESSURE BALANCED CHECK VALVE

Robert H. Welker, Sugar Land, Tex., assignor to Welker Engineering Company, Sugar Land, Tex.

Filed Jan. 7, 1983, Ser. No. 456,328
Int. Cl.[4] G01N *1/14*
U.S. Cl. 73—863.84 **6 Claims**



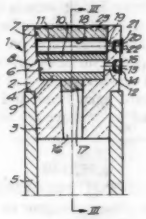
1. Sample collection apparatus comprising:
(a) an elongate hollow body adapted to have one end extended into a container having a volume of fluid therein to be sampled, said body having a remote end extending away from the container;
(b) sample gathering means at the one end of said body for insertion into the fluid to be sampled;
(c) sample outlet passage means communicating from said sample gathering means and comprising an opening in a wall of said sample gathering means and extending to a sample outlet port for delivery of a sample;
(d) valve means cooperative with said sample outlet passage means, said valve means extending into the opening of said wall for closing said sample outlet passage means;
(e) wherein said valve means comprises a circular valve seat and circular resilient seal surface means conforming in size and shape to said seat to seat and seal thereagainst; and
(f) wherein said resilient seal means is supported by a reciprocating rod, said rod extending along and within said sample outlet passage means and wherein said rod reciprocates said seal means to a closed position relative to said valve seat to reduce the dead volume thereof.

4,557,152

SAMPLING DEVICE FOR MOLTEN METALS

Jacques J. Plessers, Houthalen, and Alfons L. Theuwis, Zonhoven, both of Belgium, assignors to Electro-Nite Co., Philadelphia, Pa.

Filed Sep. 26, 1983, Ser. No. 536,594
Claims priority, application Belgium, Sep. 29, 1982, 2/59850; Jul. 19, 1983, 2/60164
Int. Cl.[4] G01N *1/12*
U.S. Cl. 73—864.55 **20 Claims**



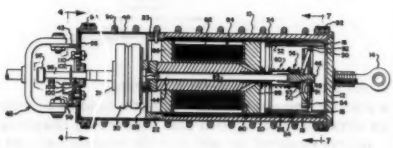
1. A sampling device for molten metals comprising a pipe (5), and a head (1) fixed on the end of the pipe, said head having a sampling chamber (11), said head (1) including a part (2–24) made of fireproof material which partially limits the sampling chamber (11), said part (2) having a supply orifice (12–46) to the sampling chamber (11) and a narrow end (3) protruding into the pipe (5), the sampling chamber (11) being located completely outside of the pipe (5), said head including a small cooling plate (9) forming a part of the wall of the sampling chamber (11), the part (2) being made of a material which has a structure permeable to gases during sampling of the molten metal.

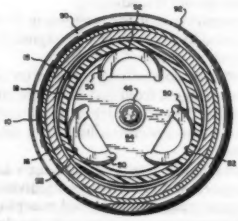
4,557,153

HARMONIC SCREW ACTUATOR

Otmar M. Ulbing, Fairport, N.Y., assignor to Air Monitor Corporation, Santa Rosa, Calif.

Filed Jun. 13, 1983, Ser. No. 503,742
Int. Cl.[4] G05G *17/00*; F16H *37/00*; H02K *7/06*
U.S. Cl. 74—2 **22 Claims**





1. A harmonic screw actuator comprising in combination a pair of inner and outer members coaxially mounted for relative axial movement, the outer member having an internal thread portion and the inner member having external thread portion,

the outer diameter of the inner member being less than the inner diameter of the outer member, the external thread portion of the inner member being resiliently deformable radially outwardly into contact with the internal thread portion of the outer member; a plurality of rollers arranged inwardly of the inner member in engagement with peripherally separate portions of the external thread portion;

a drive shaft mounted for axial and rotational movement, said rollers being supported for orbital movement in engagement with the peripherally separate portions of the external thread portion incident to rotation of the drive shaft and for outwardly and inwardly directed radial movement to engage and disengage, respectively, the peripherally separate portions of the external thread portion with the internal thread portion of the outer member incident to axially extending movement of the drive shaft relative to the inner member, whereby when the drive shaft is extended axially of the inner member and rotated, the peripherally separate portions of the external thread portion are resiliently deformed into threaded engagement with the internal thread portion and the points of thread engagement advance axially of the internal thread portion to cause the outer member to move axially of the inner member; and

means to rotate the drive shaft.

4,557,154

SHOCK ABSORBING MECHANISM IN AUTOMATIC ANALYZING AND MEASURING APPARATUS

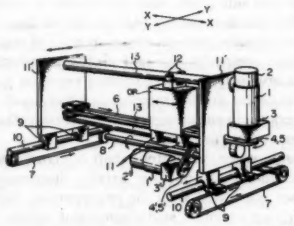
Toyotaro Iwata; Kunio Nakajima, and Hiroyuki Otsuki, all of Hyogo, Japan, assignors to Toa Medical Electronic Co., Ltd., Hyogo, Japan

Filed Sep. 16, 1982, Ser. No. 418,654

Claims priority, application Japan, Sep. 18, 1981, 56-147166

Int. Cl.⁴ F16H *27/02;* **F16D** *7/06;* **G01N** *35/00*

U.S. Cl. 74—89.21 **2 Claims**



1. A shock absorbing mechanism in an automatic analyzing and measuring apparatus of the type having an optics/dispensing device and an X-Y drive mechanism for transporting the optics/dispensing device in two dimensions, which X-Y drive mechanism has X and Y bidirectional drive sources each including a reversible drive motor and a corresponding power transmission sprocket for transmitting power from the motor to the optics/dispensing device, said shock absorbing apparatus comprising a slip clutch interposed between each drive motor and corresponding power transmission sprocket, said slip clutch comprises balls, a clutch plate, a ball retaining plate, said power transmission sprocket, and a guide plate, said clutch plate being fixedly secured to a drive shaft, said ball retaining plate, sprocket and guide plate being supported on said drive shaft for rotation, said clutch plate provides holes bored through an outer circumferential portion thereof alignable with holes bored in said sprocket, said ball retaining plate being disposed between said clutch plate and said sprocket and being freely rotatable with respect thereto, said ball retaining plate providing holes each retaining a respective ball, said balls cooperating with said clutch plate holes and sprocket holes to transfer torque from said drive shaft to said sprocket, said ball retaining plate, sprocket and guide plate being axially displaceable along said drive shaft from said clutch plate, said drive shaft having a stopper affixed thereto and a spring being compressed between said guide plate and the stopper for urging said ball retaining plate, sprocket and guide plate toward said clutch plate for operative association therewith, whereby when said sprocket is subjected to an excessive force said balls slip out of one of said clutch plate holes and sprocket holes causing said guide plate to move axially away from said clutch plate against said spring and actuate a switch so as to halt said drive motor.

4,557,155

FRICTION GEAR TRANSMISSION

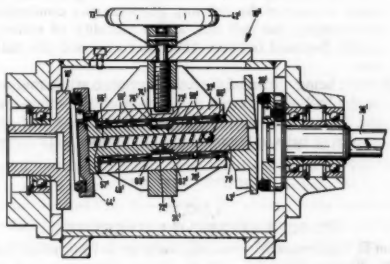
Heinz-Dieter Kopatz, Alsdorf, Fed. Rep. of Germany, assignor to William Prym-Werke KG, Stolberg, Fed. Rep. of Germany

Filed Dec. 7, 1983, Ser. No. 558,854

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1982, 3245402

Int. Cl.⁴ F16H *15/08*

U.S. Cl. 74—200 **16 Claims**



1. A friction gear transmission with at least one friction point, comprising a driven gear; a friction gear which is axially force-loaded against said driving gear; a driven shaft to which a torque is to be transmitted; and a two-part transmission shaft for transmitting the torque to said driven shaft, said transmission shaft having an inlet shaft part with an end provided with a V-shaped curved piece, and an outlet shaft part with an end provided with a V-shaped countercurved piece, said transmission shaft having an inner region in which said V-shaped curve and countercurve pieces are provided and an outer region; means for adjusting the transmission ratio of said gears and operative for radially displacing one of said gears relative to the other of said gears; means for rotatably supporting said transmission shaft and arranged in said outer region; and means for sealing in a lubricant medium-impermeable manner said inner region provided with said V-shaped curved and countercurved pieces from said outer region provided with said rotatably supporting means for supporting said transmission shaft.

4,557,156

ROTARY-TO-LINEAR CONVERTER WITH ROLLING BALLS, AND FEED MECHANISMS INCORPORATING THE SAME

Hiroshi Teramachi, 2-34-8, Higashi-Tamagawa, Setagaya-Ku, Tokyo, Japan

Filed Dec. 9, 1982, Ser. No. 448,171

Claims priority, application Japan, Dec. 29, 1981, 56-214817

Int. Cl.⁴ F16H *55/17, 55/22, 1/18, 1/20*

U.S. Cl. 74—459 **19 Claims**

1. A rotary-to-linear converter capable of translating rotary motion into rectilinear motion, comprising:

(a) a worm having a screw thread formed thereon;

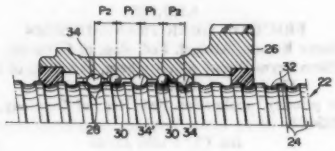
(b) a ball nut sleeved upon the worm and having an internal screw thread formed thereon;

(c) a group of antifriction balls interposed between the worm

and the ball nut for rolling motion along the threads thereon;

(d) there being a first and a second crosscut each formed across the internal thread on the ball nut for intercommunicating two neighboring turns of a helical groove defined therein by the internal thread, the first and second crosscuts being axially displaced relative to one another, thus dividing said balls into a first and second group;

(e) an antifriction bearing for rotatably supporting the ball



nut, the bearing comprising an inner ring formed by the outer surface of the ball nut, an outer ring concentrically surrounding the ball nut, and a plurality of rolling elements disposed between the outer ring and the ball nut; and

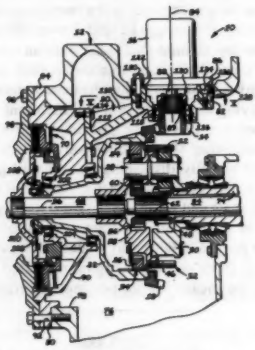
(f) there being a turn of the helical groove at the midportion of the ball nut different in width from the other turns of the helical groove for preloading the first and second groups of balls in opposite axial directions with respect to the ball nut.

4,557,157

VEHICLE STEERING DIFFERENTIAL

Eldon D. Oestmann, Morton, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 14, 1983, Ser. No. 474,858
Int. Cl.[4] F16H *57/02*
U.S. Cl. 74—607 **21 Claims**



1. A vehicle steering differential comprising:

a vehicle case defining an internal chamber, a radial opening communicating with the chamber, a laterally outwardly extending axial opening having a transverse axis, and a laterally outwardly facing mounting surface disposed about the axial opening;

an input pinion gear;

a bevel gear driven by the pinion gear; and

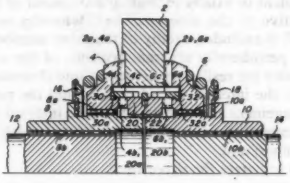
body means for rotatably supporting the pinion gear on a radial axis and the bevel gear on the transverse axis within the chamber in an intermeshing relationship, the body means including an annular body and a supporting arm, the annular body being releasably secured to the case solely at the mounting surface, and the supporting arm cantileverably extending from the annular body and within the case and supporting the pinion gear in general alignment with the radial opening of the case.

4,557,158

HOLDOUT RING CONSTRUCTION FOR DIFFERENTIALS

Walter L. Dissett, Southfield, and James R. Bawks, St. Clair Shores, both of Mich., assignors to Tractech, Inc., Warren, Mich.

Filed May 10, 1983, Ser. No. 496,095
Int. Cl.[4] F16H *35/04*
U.S. Cl. 74—650 **5 Claims**



1. Differential apparatus for driving a pair of colinearly-arranged output shafts (**12,14**) from an input driving shaft, comprising

(a) an annular center driving member (**2**) arranged in concentrically spaced relation about the adjacent ends of said output shafts, said center driving member containing on its inner peripheral surface a plurality of circumferentially spaced through slots (**2*e*, 102*e***);

(b) a pair of side gears (**8,10**) connected with the adjacent ends of said output shafts, respectively;

(c) clutch means normally connecting said center driving member with said side gears, said clutch means including a pair of annular clutch members (**4,6**) mounted for axial displacement on said side gears on opposite sides of said center driving member, respectively, said clutch members being spring biased inwardly together toward engaged positions relative to said center driving member in which teeth on said clutch members are in engagement with corresponding teeth on said center driving member;

(d) means operable when one output shaft overruns the other by a predetermined amount for axially disengaging the clutch member associated with the overrunning shaft from said center driving member, said disengaging means including

(1) an annular center cam member (**20,120**) mounted for limited angular displacement concentrically within said center driving member;

(2) said cam member having a substantially uniform outer cylindrical peripheral surface and including at each end a plurality of cam teeth (**20*a*, 20*b*; 120*a*, 120*b***) the number of which is reduced relative to the number of teeth of the corresponding clutch member, the teeth (**20*a*, 120*a***) at one end of said cam member being angularly staggered relative to the teeth at the other end thereof; and

(e) holdout ring means for maintaining said overrunning clutch member in the disengaged condition as long as the output shaft associated therewith is in the overrunning condition; said holdout ring means including

(1) a pair of annular holdout rings (**30,32; 130, 132**) arranged colinearly between said center driving member and said clutch members, respectively, said holdout rings being connected at their remote ends for angular displacement relative to the associated clutch member, respectively, said holdout rings having lugs (**30*b*,32*b*; 130*b*,132*b***) normally extending within said center driving member slots, respectively; and

(2) stop means (**2*f*; 102*n***) on said center driving member for

limiting the angular displacement of each of said holdout rings relative to said center driving member, respectively.

4,557,159

DRIVING MECHANISM FOR SLAT CURTAINS

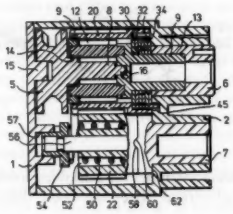
Hans Gross, Fahrionstrasse 45, D-70000 Stuttgart 40, Fed. Rep. of Germany

Filed Oct. 12, 1983, Ser. No. 541,088

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1983, 3306407

Int. Cl.[4] F16H *37/06, 3/44;* **E06B** *9/26;* **F16D** *55/00*

U.S. Cl. 74—665 GA **3 Claims**



1. A driving mechanism for slat curtains, the slats of which can be displaced in a direction transverse to their longitudinal axis and rotated about the longitudinal axis of the slats, comprising:

a planetary gearing having one drive end and two power take-offs of different torque for connection to a transport rod, effecting the longitudinal displacement of the slats, and a tilt rod effecting their rotary movement, the planetary gearing comprising a driving wheel formed with a sun wheel, a planet carrier carrying planet wheels engaging said sun wheel, and an outer wheel enclosing said planet wheel and having an internal toothing in engagement with said planet wheels, said planet carrier further having a shaft-like extension portion provided with grooves engaged by projections in a recess in the tilt rod, providing thereby a connection between the shaft-like projection and said tilt rod which is fixed against relative rotation, a plurality of rotatable disk means, each formed with a central opening for mounting on said shaft-like portion of the planet carrier, said disk means being of substantially identical diameter and being arranged in parallel abutting relation on the shaft-like portion, one of said plurality of disk means, being that one closest to said driving wheel, having radial projections in its central opening for also engaging said grooves in said shaft-like projection on the planet carrier thereby enabling said one of said disk means to rotate with said planet carrier, each of said plurality of disk means further having a projection serving as a stop for limiting rotary movement of the tilt rod on rotation of the power take-off associated therewith, each stop projection on each of said disk means extending from an edge thereof substantially perpendicularly to the plane of the disks means and into the plane of an adjacent disk means, the length of the projection being maximally equal to the thickness of the disk means, and a stop fixed to the housing for limiting rotary movement of that one of said rotatable disk means most distant from said driving wheel.

4,557,160

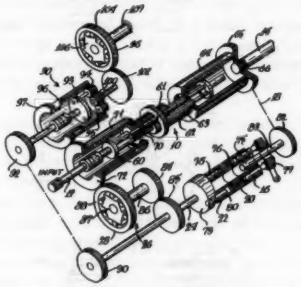
HYDRAULIC DIFFERENTIAL TRANSMISSION

Richard W. Reynolds, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Aug. 20, 1984, Ser. No. 642,078

Int. Cl.[4] F16H *47/04*

U.S. Cl. 74—687 **16 Claims**



1. A hydraulic differential transmission having a drive input and a drive output comprising, a first differential for transmitting a drive from the drive input to the drive output, a pair of hydraulic units hydraulically interconnected with one unit being of variable displacement and connected to the drive output and the other hydraulic unit being reversible in rotation, and two parallel drive trains for alternatively connecting said other hydraulic unit to said first differential with one drive train including an overrunning clutch engageable when said other hydraulic unit rotates in one direction and the other drive train including a second differential which freely rotates when the other hydraulic unit rotates in said one direction and which transmits a drive to said first differential when the other hydraulic unit rotates oppositely to said one direction.

4,557,161

INFINITELY VARIABLE ROTARY DRIVE TRANSMISSION

Egas J. DeSousa, 8373 Meadowdale, Grand Blanc, Mich. 48439

Filed Nov. 21, 1983, Ser. No. 554,009

Int. Cl.[4] F16H *35/08*

U.S. Cl. 74—837 **7 Claims**

1. An infinitely variable rotary drive transmission comprising a housing,

an input member rotatably mounted to said housing,

an output member rotatably mounted to said housing,

means for drivingly connecting said rotary input member to said rotary output member comprising:

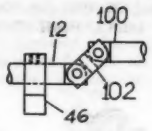
a slide and means for linearly reciprocally slidably mounting said slide to said housing,

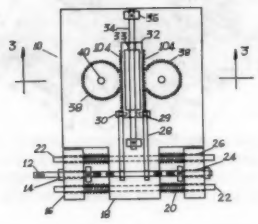
means for drivingly connecting said input member to said slide so that said slide reciprocates in unison with the rotation of said input member,

means for variably adjusting the stroke of said slide between a minimum and maximum stroke,

means for drivingly connecting said slide to said output member so that said output member rotates at a speed proportional to the stroke of said slide wherein said input member connecting means comprises an articulated shaft, said shaft connected to and coaxial with said input member, said shaft having a crank portion parallel to but radially spaced from the axis of the input member, and means

for connecting said crank portion to said slide and wherein said variable adjustment means comprises means operable





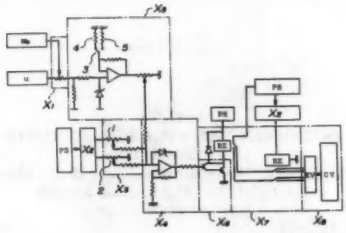
during rotation of said input member for varying the articulation of said articulated shaft.

4,557,162

METHOD AND DEVICE FOR AUTOMATIC CONTROL OF TRANSMISSION

Takao Fukunaga, Hirakata, Japan, assignor to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan

Filed Nov. 9, 1982, Ser. No. 440,331
Claims priority, application Japan, Nov. 12, 1981, 56-182139
Int. Cl.⁴ B60K *41/18*
U.S. Cl. 74—866 **8 Claims**



5. In a vehicle in which power from an internal combustion engine is transmitted through a clutch and a staged geared-transmission to driven wheels, a device for automatic control of a transmission comprising:

a speed ratio calculating circuit having simultaneous inputs corresponding to vehicle speed and engine load, said speed ratio calculating circuit being a variable resistor having two inputs and an output;

a comparator circuit common to both forward and backward movements;

an advancing/reversing signal circuit judging whether the vehicle is being advanced or reversed, and giving an actual speed ratio appropriate for forward movement in advancing the vehicle and that appropriate for backward movement in reversing it utilizing an advancing/reversing signal when an ideal speed ratio delivered from the speed ratio calculating circuit is converted into a stepped actual speed ratio in the comparator circuit;

a gearshift point circuit which is operatively connected to said comparator circuit and provides an advancing or reversing signal thereto, from an advancing variable resistor or a reversing variable resistor respectively in response to a gear selector; and

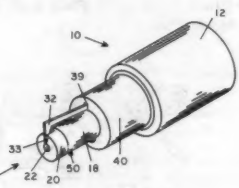
an amplification circuit which receives the output from the speed ratio calculating circuit and provides an input to said comparator circuit, said amplification circuit includes a switch for switching resistances correspnding to a maximum power or an economic power.

4,557,163

SHIELD STRIPPER FOR ELECTRICAL WIRING

John G. Tanner, Wellington, Kans., assignor to The Boeing Company, Seattle, Wash.

Filed Jul. 11, 1984, Ser. No. 629,700
Int. Cl.⁴ H02G *1/12*
U.S. Cl. 81—9.44 **8 Claims**



1. A rotary shield stripper for removing a shield from around one or more electrical wires enclosed therein, the stripper comprising:

a cylindrical bearing housing having an opening therethrough;

a bearing mounted inside the opening of the housing;

a wire guide shaft rotatably mounted inside the bearing, the shaft extending outwardly from the housing and having a wire guide aperture through the length of the shaft, the aperture adapted for receiving the electrical wires with shield therethrough;

a cutting blade having a blade edge received in a blade slot in the shaft; and

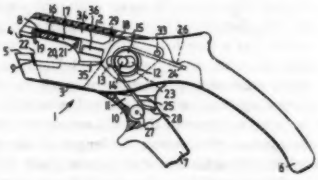
a movable collar disposed around the shaft and cutting blade, when the collar is moved to a forward position outwardly from the housing the blade is pivoted and the blade edge is lowered downwardly in the blade slot for cutting through the shield.

4,557,164

WIRE AND CABLE STRIPPING DEVICE

Josef Krampe, Bergstrasse 5, 4715 Ascheberg-Herbern, Fed. Rep. of Germany

Filed Nov. 10, 1983, Ser. No. 551,823
Claims priority, application Fed. Rep. of Germany, Nov. 10, 1982, 3241530
Int. Cl.⁴ H02G *1/12*
U.S. Cl. 81—9.41 **13 Claims**



1. A wire and cable stripping device, comprising two com-

plementary arms each having at one end a handle portion and at the other end a jaw portion carrying a gripping jaw; pivot means including a cylindrical pin pivotally connecting said arms intermediate the respective ends thereof for movement about a pivot axis of said pin extended normal to an elongation of said arms, said jaw portions being movable towards each other by said handle portions so as to move the gripping jaws towards an insulated wire to be stripped and grip a wire; two opposing stripping members rigidly mounted on respective jaw portions to move therewith for severing the insulation on a wire when said gripping jaws grip a wire, each of said arms having an intermediate portion between the jaw portion and the handle portion and being formed at said intermediate portion with an oblong opening, the oblong openings of two arms being connected with each other and accommodating said cylindrical pin which is slidably positioned therein; a centering element mounted between the intermediate portions of said arms for centering said cylindrical pin; an intermediate connecting element pivotally mounted on said centering element for connecting said centering element to one of said gripping jaws; an extension piece for connecting one of said gripping jaws to said intermediate connecting element; and a multi-stage spring wrapped around said centering element and having two spread end portions extended towards the respective handle portions and cooperating therewith to press said arms against each other to permit a displacement of said arms and thus said opposing stripping members relative to each other in said direction of elongation and a step-like pivotal movement of said arms relative to each other against a force of said spring, whereby, after severing the insulation on a wire, one of said arms with one of said stripping members is displaced relative to the other of said arms with the other stripping member in said direction of elongation in response to a further movement of said jaw portions towards each other so as to strip the insulation from the wire.

4,557,165

ROD-SUPPLY ARRANGEMENT FOR AN AUTOMATIC LATHE

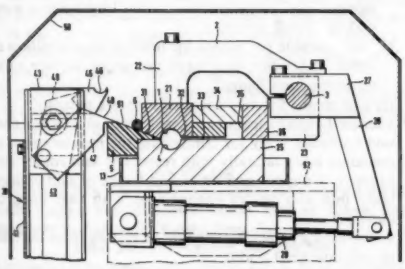
Johannes Werkmeister, Bahnhofstrasse 2, 6981 Collenberg, and Ernst Tietz, Richard-Wagner-Strasse 11, 8761 Bürgstadt, both of Fed. Rep. of Germany

Filed Jul. 21, 1983, Ser. No. 515,798

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1982, 3233692; May 28, 1983, 8315766[U]

Int. Cl.[4] B23B *13/10*

U.S. Cl. 82—2.7 **14 Claims**



1. A rod supply apparatus for advancing a rotatable rod of material comprising:

a support having an elongated guide channel and an elongated surface adjacent said guide channel;

a cover, swingably mounted on the support and extending over the full length of the guide channel, having means cooperating with said guide channel to define an elongated guide tube and including an elongated surface mating with the elongated surface of the support, when the cover is in a closed position;

means for swinging the cover between (a) a closed position in which the cover cooperates with the elongated guide channel to define an elongated guide tube and the elongated surfaces of the cover and the support are in mating engagement and (b) an open position in which said elongated surfaces are spaced apart from one another and in which a rod of material to be advanced can be fed laterally into the guide channel;

feed means adjacent the elongated surface of the support to feed a rod of material laterally toward the guide channel, the elongated surface of the support being positioned to receive a rod of material which is fed laterally from the feed means to support the rod of material for lateral movement into the guide channel, when the cover is in its open position;

a feed rod movable axially in the elongated guide tube having a forward end carrying a rotatable coupling element connectable to a rod of material to be advanced by the rod supply apparatus;

means on the support to move the feed rod axially in the elongated guide tube to advance a rod of material connected to the rotatable coupling element; and

means connected to the support supplying oil to the elongated guide tube when the cover is in its closed position, so that upon rotation and advancement of a rod of material, oil contained in said guide tube is entrained by the rotation of the rod of material to form an oil film centering said rod in said guide tube, with the mating elongated surfaces of the cover and the support forming a seal to prevent lateral leakage of oil from said guide tube.

4,557,166

AUTOMATIC MULTIPLE WORKPIECE TURNING MACHINE

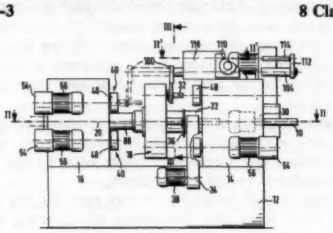
Kurt Jauch, Schillerstrasse 1, D-7445 Bempflingen, Fed. Rep. of Germany

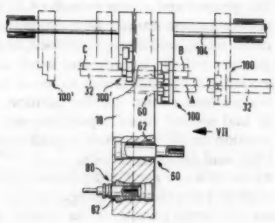
Filed Feb. 10, 1983, Ser. No. 465,396

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1982, 3204886; Jan. 18, 1983, 3301475

Int. Cl.[4] B23B *13/04, 15/00, 3/34*

U.S. Cl. 82—3 **8 Claims**





1. In an automatic multiple workpiece turning machine having

a work turret having means to rotate it by steps around a central axis,

machining devices, which are disposed around the central axis in a multiplicity of stations,

a charging device for feeding in workpieces,

a first group of clamping devices which are disposed on said work turret around and parallel to the central axis, said first group of clamping devices facing the charging device, and each having means to receive and clamp one side of one of the workpieces taken over from said charging device,

a second group of clamping devices disposed on the side of said work turret which is averted from said charging device, said clamping devices each formed to clamp a machined end of a workpiece,

work transfer means to remove partially machined workpieces from said first group of clamping devices, and transfer the workpieces to said second group of clamping devices so as to be clamped at their machined ends and subsequently machined at the end which are previously clamped by said first group of clamping devices,

said work transfer means including at least one gripper and means to move said at least one gripper to and fro between transfer positions on both sides of said turret,

said means to move said at least one gripper including means to tilt around and displace said gripper along an outer axis, said outer axis being parallel to the central axis, and

a mounting frame with said work turret mounted for rotation thereon, head stocks on said frame on opposite sides of said work turret with said machining devices mounted on said head stocks, said work transfer means and said charging device being mounted for movement relative to said mounting frame.

7. In an automatic multiple workpiece turning machine having

a work turret having means to rotate it by steps around a central axis,

machining devices, which are disposed around the central axis in a multiplicity of stations,

a charging device for feeding in workpieces,

a first group of clamping devices which are disposed on said work turret around and parallel to the central axis, said first group of clamping devices facing the charging device, and each having means to receive and clamp one side of one of the workpieces taken over from said charging device,

a second group of clamping devices disposed on the side of said work turret which is averted from said charging device, said clamping devices each formed to clamp a machined end of a workpiece,

work transfer means to remove partially machined workpieces from said first group of clamping devices, and transfer the workpieces to said second group of clamping devices so as to be clamped at their machined ends and subsequently machined at the end which are previously clamped by said first group of clamping devices,

said work transfer means including

a first gripper and means to move said gripper to and fro between a first transfer position on the side of said work turret facing said charging device, and a second transfer position radially outside said work turret, and

a second gripper and means to move said gripper to and fro between a third transfer position, which is adjacent to said second transfer position, and a fourth transfer position on the side of said work turret which is averted from said charging device,

said means to move each said gripper including means to tilt around and displace said gripper along an outer axis, said outer axis being parallel to the central axis, and

a mounting frame with said work turret mounted for rotation thereon, head stock on said frame on opposite sides of said work turret with said machining devices mounted on said head stocks, said work transfer means and said charging device being mounted for movement relative to said mounting frame.

4,557,167

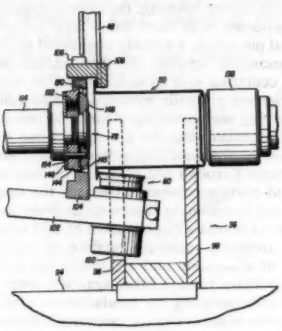
APPARATUS FOR TRIMMING A SCRAP RING FROM A CYLINDRICAL CONTAINER BODY AND METHOD OF OPERATION

Daniel S. Cvacho, 241 Kirkley Cr., Forest, Va. 24551

Filed Aug. 3, 1984, Ser. No. 637,530

Int. Cl.[4] B23B *1/00, 5/14*

U.S. Cl. 82—47 **16 Claims**



1. An apparatus for trimming a scrap ring from a cylindrical container body having one closed end, said scrap ring being part of a container flange member which extends substantially at right angles to said cylindrical container body, said apparatus comprising:

a. a rotary turret member having generally hemispherical pocket members for receiving, transporting and discharging cylindrical container bodies;

b. a rotary disk trim ring cutter assembly associated with at least one of said pocket members; said rotary disk trim ring cutter assembly comprising

(1) a main disk cutter aligned with a pocket member of said rotary turret member,

(2) means to rotate said main disk cutter about its longitudinal axis continuously during the cutting operation,

(3) an auxiliary disk cutter having its longitudinal axis substantially perpendicular to the longitudinal axis of said main disk cutter,

(4) reciprocable bar means for holding said auxiliary disk cutter in position to engage the under surface of said scrap ring and flange,

(5) and means for reciprocating said bar means;

c. vacuum holding means engageable with said closed end of said container body for controlling the movement of said container body laterally with respect to said rotary turret to move the upper surface of said flange of said container body into and out of engagement with said main disk cutter;

d. and stripping means to strip said scrap ring from the flange of said container body.

12. A method of trimming a trim ring from a flange member of a cylindrical can body having one closed end which comprises the steps of

a. feeding said can body into a pocket formed in a rotary turret which rotates continuously during the trimming operation,

b. holding said can body with a vacuum applied to said closed end of said can body,

c. moving said can body laterally with respect to said pocket into engagement with a rotating main disk cutter,

d. following said can body in its movement laterally of said pocket with an auxiliary disk cutter whose axis of rotation

is substantially at right angles to the axis of said main disk cutter,

e. overfeeding said auxiliary disk cutter against resilient pressure means to cause said auxiliary disk cutter to rotate by frictional engagement with the underside of said flange member,

f. severing a trim ring from said flange member,

g. gripping said trim ring between trim ring holding segments mounted on said rotary turret with said holding segments engaging one side of said trim ring and a stripper plate member movable into engagement with the other side of said trim ring,

h. removing said can body from said trim ring by moving it toward said pocket while said trim ring is being held,

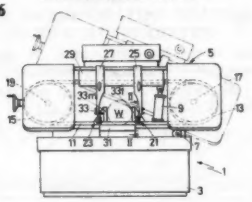
i. and releasing said trim ring by moving said stripper plate away from said trim ring holding segments.

4,557,168

METHOD AND APPARATUS FOR DETECTING THE CUTTING RESISTANCE IN BANDSAW MACHINES

Toru Tokiwa, Odawara, Japan, assignor to Amada Company, Limited, Japan

Filed Mar. 28, 1983, Ser. No. 479,122
Claims priority, application Japan, Mar. 30, 1982, 57-49992
Int. Cl.⁴ B23D *53/00*
U.S. Cl. 83—56 **12 Claims**



1. A method for controlling a bandsaw blade in response to the cutting resistance of a workpiece to the bandsaw blade, comprising the steps of:

(a) providing a pivot lever having a sensing element mounted therein in alignment with the pivot point of the lever;

(b) amplifying movement of the bandsaw blade in a direction opposite to a direction of feed of the bandsaw blade and normal to a running direction of the bandsaw blade by rocking the pivot lever and sensing element with a movement representative of the actual blade movement

(c) detecting the amplified movement of the bandsaw blade in the direction opposite to the direction of feed of the bandsaw blade and normal to the running direction of the bandsaw blade by the sensing element; and

(d) adjusting the feeding force of the bandsaw blade during a cutting operation in immediate response to the magnitude of the movement of the bandsaw blade.

4,557,169

CONTINUOUS TAG CUTTING/FEEDING APPARATUS

Hiroshi Kajiya, and Hidetomo Sasaki, both of Tokyo, Japan, assignors to Kabushiki Kaisha Sato, Japan

Filed Jul. 5, 1983, Ser. No. 510,399
Claims priority, application Japan, Jul. 8, 1982, 57-102507
Int. Cl.⁴ B26D *5/32*
U.S. Cl. 83—156 **5 Claims**

1. A continuous tag feeding and cutting apparatus, comprising:

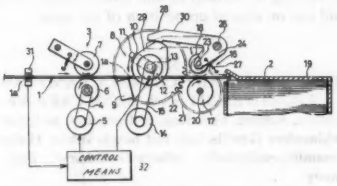
a first feeding mechanism for feeding an uncut strip of tags;

a cutting mechanism placed for having the strip fed thereto and therepast by the first feeding mechanism; the cutting mechanism comprising a rotary blade supported on a shaft;

means connected with the shaft for periodically rotating the shaft to bring the rotary blade into engagement with the strip for thereby cutting the strip fed to the cutting mechanism;

a second feeding mechanism located after the cutting mechanism in the path of the tag strip for having the strip fed thereto by the first feeding mechanism and for feeding a tag cut from the tag strip; the second feeding mechanism comprising a driving roller for rotating and for engaging the strip to move the strip; drive means connected to the driving roller for driving the driving roller to rotate, the drive means being driven from the shaft as it rotates; and a driven roller movable into engagement with the driving roller for engaging the tag strip between the driving and the driven rollers and for moving the strip, and the driven roller also being movable off the driving roller for disengaging the tag strip so that the driving roller does not move the tag strip;

a feed control mechanism connected with the shaft and with the second feed mechanism for disengaging the second feed mechanism from a tag being cut while the rotary blade is moving and before the cutting of the tag strip and for reengaging the second feed mechanism with the cut tag after the cutting of the tag strip and while the blade is



rotating beyond the position of cutting and is rotating around again toward the position of cutting for the next cut;

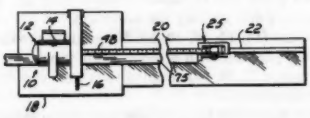
the feed control mechanism comprising a cam on the shaft and rotatable with the rotary blade; the cam having a first section and a second section; a cam follower connected with the driven roller and being engageable with one of the cam first and second sections; the cam follower being movable for moving the driven roller to engage the driving roller when the cam follower engages the first cam section, and the cam follower being movable for moving the driven roller to disengage from the driving roller when the cam follower engages the second cam section; the first cam section being located so as to engage the cam follower while the rotary blade is rotating from a position after tag cutting to a position prior to the next tag cutting, and the second cam section being located so as to engage the cam follower while the rotary blade is rotating from a position prior to tag cutting through the tag cutting to a position following tag cutting.

4,557,170

WORKPIECE SAW CUTOFF LENGTH MEASURING DEVICE

Gary G. Ingham, 737 N. Janeway, Moore, Okla. 73160

Filed Apr. 20, 1984, Ser. No. 602,288
Int. Cl.⁴ B26D *7/16*; B27B *27/10*
U.S. Cl. 83—468 **2 Claims**



1. A work piece cutoff length measurement indicator in combination with a workpiece supporting horizontal saw platform and a saw including a blade adapted for movement in a vertical plane toward and away from a workpiece on the platform, the improvement comprising:

a workpiece guide rail secured to said platform and extending laterally from the plane of the saw blade and having an upper surface and a workpiece aligning face;

a flexible measuring tape;

a channel member longitudinally overlying the upper surface of said guide rail and surrounding the tape case;

frame rails depending from said channel member for slidably contacting opposing sides of said guide rail during movement of said frame means;

measuring tape supporting frame means including a workpiece end engaging stop transversely overlying the workpiece guide rail in longitudinal sliding relation for visually indicating the distance between said frame means and the adjacent surface of the saw blade,

said workpiece stop including,

a stop disposed laterally of the frame means adjacent the guide rail workpiece aligning face, and,

stop support means adjustably connecting said stop with the frame means for adjusting the position of the stop relative to the length of the channel member; and,

tape clamp means supported by said channel member for preventing movement of said frame means relative to the paid out or wound up position of the tape.

4,557,171

MACHINE TOOL, PARTICULARLY BAND SAW, WITH LIGHTWEIGHT SAW BAND CARRIER

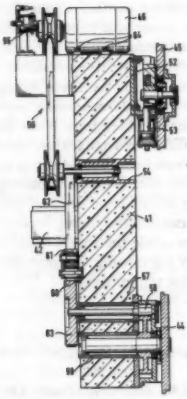
Paul Stolzer, Achern, Fed. Rep. of Germany, assignor to Keuro Maschinenbau Gesellschaft mit beschränkter Haftung & Co. Kommanditgesellschaft, Achern-Gamshurst, Fed. Rep. of Germany

Filed Apr. 19, 1984, Ser. No. 602,003

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1983, 8312211[U]

Int. Cl.[4] B23D *55/06*

U.S. Cl. 83—796 **9 Claims**



1. Band saw having a frame (**1**, **20**, **40**);

a workpiece support secured to the frame to hold and position a workpiece (**10**, **23**, **51**) thereon;

an endless saw band (**8**, **26**, **48**);

saw band guide and transport pulleys (**5**, **6**; **25**, **27**; **44**, **45**) supporting and guiding the saw band;

guide means (**11**, **12**; **29**, **30**; **49**, **50**) guiding the saw band in oriented position with respect to the workpiece;

a drive motor (**7**, **24**, **46**) coupled to at least one of the guide and transport pulleys;

feeding means (**4**) to feed the saw band relative to the workpiece; and

a carrier or carriage (**3**, **22**, **41**) for supporting the guide and transport pulleys, the guide means, and the drive motor, and coupled to the feeding means,

wherein, in accordance with the invention, the carrier or carriage (**3**, **22**, **41**) comprises

a cast structure essentially and primarily consisting of concrete polymer; and

wherein

bearings (**52**, **54**, **57**, **59**, **60**, **61**) for journalling the pulleys (**5**, **6**; **25**, **27**, **44**, **45**),

guide attachment means for the saw band guide means (**11**, **12**; **29**, **30**; **49**, **50**),

motor attachment means for the motor (**7**, **24**, **46**),

feed attachment means for moving the carrier relative to the workpiece,

comprise attachment elements cast into the concrete polymer.

4,557,172

SAW BLADE

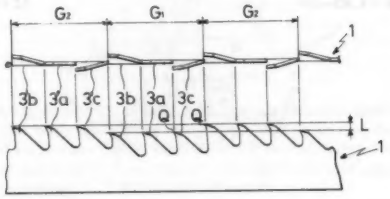
Akiyoshi Yoneda, Akashi, Japan, assignor to Amada Company, Limited, Japan

Continuation of Ser. No. 456,536, Jan. 7, 1983, abandoned. This application Dec. 24, 1984, Ser. No. 684,180

Claims priority, application Japan, Jan. 13, 1982, 57-2650

Int. Cl.[4] B23D *61/00*

U.S. Cl. 83—848 **3 Claims**



1. A saw blade for cutting hardened metals comprising:

a plurality of cutting teeth, each tooth having a tooth tip having first and second rake angles and first and second relief angles;

a gullet between each tooth, said gullets being of varying depth;

the tips of said teeth being set at varying heights;

some of said teeth being angularly set and others of said teeth being disposed in the plane of the blade;

said teeth being set on said saw blade at varied pitches;

the teeth being set in groups of like numbers of teeth with all the teeth in each group being of the same height;

wherein the height of the teeth in each group differ from the height of the teeth in any adjacent group;

whereby vibration and noise are reduced because the teeth are varied in natural frequency.

4,557,173

MUSIC BOX

Akihiko Isaka, Nagano, Japan, assignor to Kabushiki Kaisha Sankyo Seiki Seisakusho, Nagano, Japan

Continuation of Ser. No. 451,225, Dec. 20, 1982, abandoned. This application Nov. 15, 1984, Ser. No. 671,799

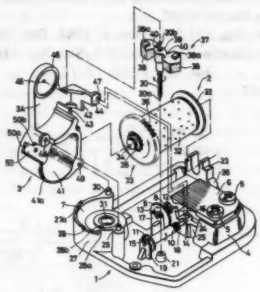
Claims priority, application Japan, Dec. 25, 1981, 56-195397[U]; Jun. 18, 1982, 57-104871

Int. Cl.[4] G10F *1/06*

U.S. Cl. 84—95 R **4 Claims**

1. A spring case, comprising; a spring case body made of synthetic resin and housing a spring, and a metallc frame constituting a portion of said spring case and supporting the spring case body thereon, said spring case having a peripheral wall having a first end face, said frame having a peripheral wall having a second end face, said spring case body and said frame jointly having a window for inserting a spring therethrough,

said window having a narrow portion for retaining an end of said spring and a wider portion for admitting said spring, said window being defined by confronting recesses formed respectively in at least one of said first and second end faces, said spring having an outer end adapted to be held at said narrow portion and partly engaging said metallic frame.

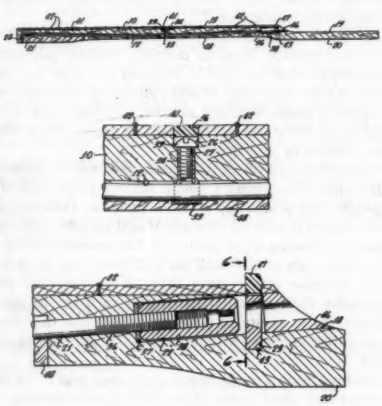


4,557,174

GUITAR NECK INCORPORATING DOUBLE-ACTION TRUSS ROD APPARATUS

Charles A. Gressett, Jr., Brea, Calif., assignor to Fender Musical Instruments Corporation, Brea, Calif.

Filed May 6, 1983, Ser. No. 492,260
Int. Cl.[4] G10D *3/00*
U.S. Cl. 84—293 **17 Claims**



1. A guitar neck incorporating double-action truss rod apparatus, comprising:

(a) an elongated guitar neck body,

(b) an elongated truss rod mounted in said body longitudinally thereof,

said truss rod being, at all times, bowed in a single direction and in a plane that is transverse to the upper side of said neck body,

said truss rod having strength and rigidity sufficiently high to transmit large compressive and tensile forces, but sufficiently low that said large compressive and tensile forces will change the degree of said bowing in said single direction,

(c) anchor means, connected to said neck body, to restrain at least an intermediate region of said truss rod against substantial transverse movement relative to said neck body, whereby said changing in the degree of bowing of said truss rod will effect corresponding bowing of said neck body,

(d) means to restrain one end of said truss rod against substantial rotational or longitudinal movement relative to said neck body,

(e) an adjustment nut mounted coaxially on the other end of said truss rod and threadedly associated with such other end, and

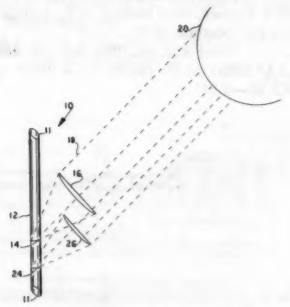
(f) bearing means associated with said nut and responsive to rotation of said nut in opposite directions to apply said large compressive and tensile forces to said truss rod.

4,557,175

LIGHT-RESPONSIVE MUSICAL INSTRUMENT

Martin Schumann, 4526-1st Ave. N., St. Petersburg, Fla. 33713

Filed Mar. 22, 1984, Ser. No. 592,226
Int. Cl.[4] G10D *17/00*
U.S. Cl. 84—330 **16 Claims**



1. A musical instrument, comprising,

a transparent tube member of predetermined dimension and configuration,

said tube member disposed in generally upstanding disposition,

a heat generating member disposed interiorly of said tube member, in the lower half thereof,

said heat generating member having its peripheral edges fixedly secured to the inner sidewalls of said tube member,

said heat generating member being formed of an open mesh material capable of absorbing radiant energy,

a radiant energy source external to said tube member for heating said heat generating member,

and a focusing means for concentrating the heat of said radiant energy source upon said heat generating member so that musical sound is emitted by said tube member in response to heating of said heat generating member by said radiant energy source.

4,557,176

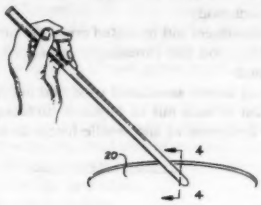
PRACTICE DRUMSTICK

Alan Boturla, 268 Semel Ave., Garfield, N.J. 07026

Filed Feb. 11, 1985, Ser. No. 700,498
Int. Cl.[4] G10D *13/02*
U.S. Cl. 84—422 S **7 Claims**

1. A drumstick for practice drum playing comprising an elongated, hollow, non-tapered body portion made of a radially resilient material, ranging in density from 0.7 grams per cubic centimeter to 1.2 grams per cubic centimeter, having an interior diameter of between 10 and 20 millimeters, and having

a substantially constant wall thickness of between 0.5 and 1.0 millimeters, said body portion having a closed, rounded striking tip at one end and an open, non-tipped section, also capable of striking, at the opposite end thereof.

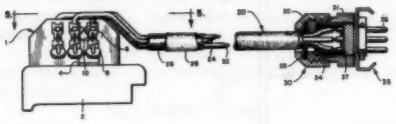


4,557,177

ELECTROMECHANICAL ACTUATOR

Joseph J. Cheney, West Seneca, N.Y., assignor to C.T.M. Company, Inc., Buffalo, N.Y.

Filed Apr. 26, 1983, Ser. No. 488,686
Int. Cl.[4] G05G *17/00*; H01R *13/54*; F41F *5/02*; B64D *1/04*
U.S. Cl. 89—1.51 **5 Claims**



1. In an electromechanical actuator system for a bomb rack including electromechanical switch means for responding to a control signal to actuate a bomb rack plunger, an electrically conductive housing for enclosing the switch means, the switch means having a control signal circuit and an indicator light circuit, the improvement comprising:

a first capacitor installed in the control signal circuit within the housing and a second capacitor installed in the light indicator circuit within the housing;

a filter line cable including a plurality of conductors which are connected at one end to the switch means, each conductor being encased in a first electrical insulating material, an electrically conductive shield being wrapped around the insulated conductors, the shield being encased in a second electrical insulating material, and the cable being at least 12 inches in length;

the housing including a first section and a second section and being grounded to a vehicle, each section forming a complementary semi-circular edge of a hole, the shield and the conductors and first insulating material within the shield passing through the hole, the edges of the hole contacting substantially the entire periphery of the shield so that the shield can be grounded through the housing via the edges only and the edges clamping the cable to the housing

a multi-prong plug to which the other ends of the conductors are connected;

an electrically conductive connector attached at one end to the plug and at its other end to substantially the entire periphery of the shield nearest the plug, the connector being grounded to a vehicle so that substantially the entire periphery of the shield can also be grounded via the connector; and

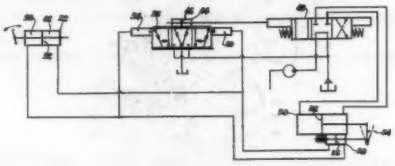
the first and second capacitors and the filter line cable, having its periphery grounded at both ends via the housing and the connector, cooperating to filter and suppress high frequency electromagnetic emissions from the switch and high frequency electromagnetic interference.

4,557,178

SERVO AMPLIFICATION SYSTEM

Clarence F. Batchelder, Jamul; Charles E. Thomas, San Diego, and Kent B. Casady, La Jolla, all of Calif., assignors to Clipp Control, San Diego, Calif.

Division of Ser. No. 327,386, Dec. 4, 1981, Pat. No. 4,394,102. This application Jul. 18, 1983, Ser. No. 514,938
Int. Cl.[4] F15B *13/16*
U.S. Cl. 91—367 **5 Claims**



1. Pilot control means for operation of an hydraulic drive piston (**52**) in an hydraulic drive cylinder (**50**) in response to hydraulic command signals from a double-acting control piston (**32**) in a control cylinder (**22**), said drive piston being operatively connected to a double-acting feedback piston (**56**) in a feedback cylinder (**58**), said control means comprising:

(a) a cylinder (**130**);

(b) a piston (**132**) non-rotationally slidably seated in said cylinder and having a longitudinal bore and a piston rod (**134**) extending outside said cylinder, said piston rod being operatively connected to said drive piston;

(c) fluid delivery passageway (**148, 150**) defined in said piston and cylinder communicating between a port (**152**) defined in said piston and opening into said bore, and an external hydraulic vessel;

(d) a rotatable spindle (**154**) seated in said bore and having relieved surface portions defining internal passageways communicating selectively between said port and selectably the alternate ends of said cylinder as a function of the degree of rotation of said spindle, whereby control of the delivered force and displacement of piston rod is effected by rotation of said spindle;

(e) means for controlling rotation of said spindle in opposite directions comprising a pinion defined at one end of said spindle and a laterally slidable rack bar (**166**) engaging said pinion to control rotation of said spindle, said control means including input ports (**34, 36**) communicating with opposite ends of said rack bar and connected to said control cylinder on opposite sides of said control piston, whereby sliding movement of said rack bar in opposite directions to rotate said pinion in opposite directions is controlled in response to movement of said control piston; and

(f) feedback means for feedback control of said drive piston comprising feed ports (**174, 176**) communicating with opposite ends of said rack bar and connected to opposite ends of said feedback cylinder, whereby pilot orders from the control cylinder are cancelled.

4,557,179

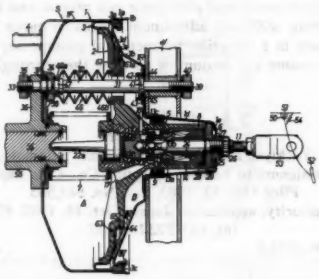
VACUUM BOOSTER DEVICE

Hiroo Takeuchi, Asashina; Nobuaki Hachiro, and Yoshihisa Miyazaki, both of Ueda, all of Japan, assignors to Nissin Kogyo Kabushiki Kaisha, Nagano, Japan

Continuation of Ser. No. 272,254, Jun. 10, 1981, abandoned. This application Dec. 17, 1984, Ser. No. 682,472
Claims priority, application Japan, Sep. 25, 1980, 55-133317
Int. Cl.[4] F01B *11/02*
U.S. Cl. 91—369 A **3 Claims**

1. In a vacuum booster device comprising a booster shell, an axially slidable booster piston accommodated in said booster shell, a piston diaphragm the inner and outer peripheral edges of which are respectively fixed to the rear surface of said

booster piston and the inner peripheral surface of said booster shell, a front side first working chamber and a rear side second working chamber defined in said booster shell by said booster piston and said piston diaphragm, said first working chamber communicating with a vacuum supply source, said second working chamber selectively communicating with said first working chamber or the external atmosphere through a control valve, an input rod arranged opposite to said booster piston for movement toward and away from the latter and connected to said control valve so as to produce a pressure difference between both of said working chambers effective to cause said booster piston to follow forward movement of said input rod, tie rods extending through said booster piston for connection of the front and rear walls of said booster shell, and



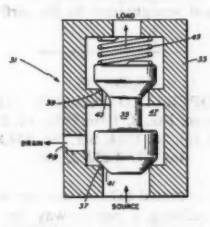
a flexible bellows arranged between said tie rod and said booster piston, said flexible bellows enabling said booster piston to be operable, the improvement which comprises positioning means for circumferentially peripherally positioning said piston diaphragm on said booster shell and for preventing relative relation therebetween which are arranged between said booster shell and said piston diaphragm, and positioning means for circumferentially peripherally positioning said booster piston on said piston diaphragm and for preventing relative rotation therebetween which are arranged between said piston diaphragm and said booster piston, said means for circumferentially peripherally positioning said booster piston with respect to said piston diaphragm being adapted to engage the piston and the diaphragm together by radial concavo-convex engagement.

4,557,180

CONTROL VALVE AND HYDRAULIC SYSTEM EMPLOYING SAME

J. Robert Glomeau, Dover, Mass., assignor to Rexa Corporation, Dover, Mass.

Filed Mar. 28, 1983, Ser. No. 479,672
Int. Cl.⁴ F15B *11/08, 13/04*
U.S. Cl. 91—446 **8 Claims**



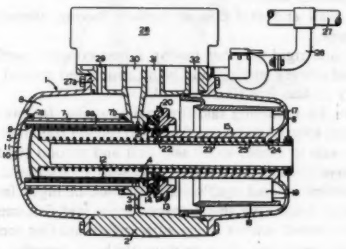
6. A hydraulic system comprising:
a variable volume load;
a sump;
a unidirectional pump for drawing fluid from said sump and providing fluid under pressure;
a release valve;
between said pump and said load, a reciprocative check valve comprising first and second mating pairs of valving surfaces which are axially spaced and mechanically coupled and arranged to open in synchronism when the pump pressure exceeds the load pressure, and which are connected in series between said pump and said load, said reciprocative check valve providing also a chamber which is located axially between said pairs of valving surfaces, said chamber being connected directly to said release valve and, through said release valve, to said sump
whereby, when said release valve is closed, operation of said pump will expand the load volume and, when said release valve is open, operation of said pump will contract the load volume.

4,557,181

BRAKE CYLINDER/AIR RESERVOIR DEVICE

James E. Hart, Trafford; Willard P. Spalding, Penn Hills, and Allen W. Kyllonen, Plum, all of Pa., assignors to American Standard Inc., Wilmerding, Pa.

Filed Dec. 13, 1983, Ser. No. 561,026
Int. Cl.⁴ F15B *11/16*
U.S. Cl. 91—519 **37 Claims**



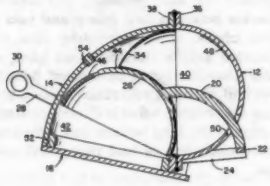
1. An actuator device comprising:
(a) a main cylinder housing having a partition with an axial opening therein;
(b) a first cylinder on one side of said partition;
(c) a second cylinder on the opposite side of said partition;
(d) a support member projecting inwardly from said second cylinder;
(e) a dual-piston assembly movable between a brake application position and a brake-release position including:
(i) a positioning piston in the form of an elongated, tubular-shaped body projecting through said opening and having a closed end operatively disposed on said one side of said partition and an open end operatively disposed on said opposite side through which open end said support member extends into said tubular body, said closed end of said positioning piston cooperating with said first cylinder and said one side of said partition to form a positioning chamber; and
(ii) an annular power piston connected to said tubular body at said open end thereof so as to form in cooperation with said opposite side of said partition and said second cylinder an application chamber, and to form in cooperation with said second cylinder and said support member a release chamber;
(f) first seal ring means engageable with the outer periphery of said tubular body and said partition for effecting fluid pressure isolation between said positioning chamber and said application chamber; and
(g) second seal ring means engageable with the inner periphery of said tubular body and said support member for effecting fluid pressure isolation between said release chamber and atmosphere.

4,557,182

EXPANSION CHAMBER DEVICES

Wilbur S. Mount, 90 Whistler Way, Box 946, E. Falmouth, Mass. 02536

Filed Jun. 7, 1984, Ser. No. 618,198
Int. Cl.[4] F16J *3/00*
U.S. Cl. 92—90 **9 Claims**



1. An expansion device for converting changes in fluid pressure to displacement of a moving machine part or converting displacement of a moving part to changes in fluid pressure, said device comprising

a first flexible expansion chamber wall at least partially defining a first expansion chamber region on one side of it,

said wall being curved and having an inner surface,

a first rigid member having a convex surface supporting said chamber wall,

said wall and said convex surface having almost the same shape,

a second rigid member having a first concave surface facing said convex surface, and being connected around its periphery to said first flexible wall,

means for mounting said first rigid member for pivotal movement toward and away from said second rigid member about an axis to cause, when said first and second rigid members move toward each other, said wall to fold over so that a portion of said wall's inner surface changes from an expanded concave shape spaced from said first member to a contracted convex shape adjacent to said first member, said wall reversing its curvature without harmful stretch or distortion, and

said flexible wall being substantially spaced from said first concave surface of said second rigid member when said first rigid member is spaced from said second rigid member in an expanded position, said flexible wall being moved toward said concave surface to said second rigid member and said first rigid member is moved toward said second rigid member,

a first displacement connector attached to one of said rigid members.

4,557,183

INCREMENTALLY ADJUSTABLE VENT

Stanley Kolt, Mamaroneck, N.Y., assignor to Leonard W. Suroff, Jericho, N.Y., a part interest

Filed Nov. 21, 1984, Ser. No. 673,588
Int. Cl.[4] F16K *24/04*
U.S. Cl. 98—42.16 **11 Claims**

1. An incrementally adjustable vent for permitting the passage of air from one defined space to another space comprising:

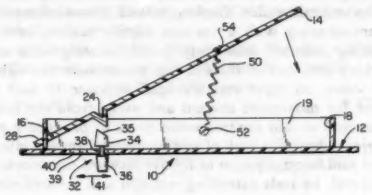
(a) frame means for mounting over an opening communicating between said spaces having a passageway disposed therethrough, said frame means including;

(i) movable adjustment means for adusting the amount of opening of said passageway, and

(ii) detent means for incrementally determining the amount of said opening; and

(b) flap means movably mounted to said frame, said flap means being movable from a closed position substantially blocking said passageway to an open position permitting the free flow of air therethrough, including;

(i) a pivotal axis disposed proximate one edge of said flap means, and



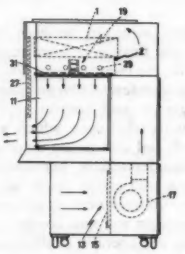
(ii) means positioned proximate said pivotal axis for cooperating with said adjustment means to move said flap means in a direction to open said passageway thereby increasing the amount of air flow therethrough.

4,557,184

CLEAN BENCH

Ken Orii, Yachiyo, and Takao Kawakami, Kitamoto, both of Japan, assignors to Yamato Scientific Co., Ltd., Japan

Filed Oct. 13, 1983, Ser. No. 541,563
Claims priority, application Japan, Oct. 15, 1982, 57-181035
Int. Cl.[4] F23J *11/00*
U.S. Cl. 98—115.3 **4 Claims**



1. An outlet wind velocity measuring apparatus for a filter provided in a clean bench, comprising:

a defined air space vertically arranged at the air outlet side of said filter;

an air duct mounted within said defined air space and having its opposite open ends oriented in an air flowing direction;

an airflow straightener means provided at an intermediate position within said air duct; and

a wind velocity sensor provided within the air duct at the air outlet side of the airflow straightener means;

said wind velocity sensor adapted to detect the velocity of the outlet wind straightened by the airflow straightener means.

4,557,185

SOLENOID OPERATED EXHAUST AIR DAMPER

Ronald M. Harriman, Rte. 3, Twin Falls, Id. 83301

Filed Jul. 26, 1984, Ser. No. 634,821
Int. Cl.[4] F23J *25/08*
U.S. Cl. 98—116 **6 Claims**

1. The solenoid operated exhaust damper which comprises:

(a) a housing defining a passageway for exhausting air, adapted for installation as a segment of an exhaust air duct;

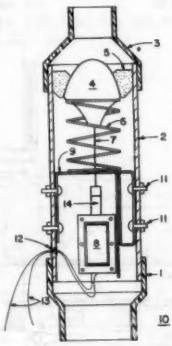
(b) mounting means disposed within said housing;

(c) a solenoid having both an energized and deenergized position for its solenoid shaft attached to said mounting means in a position wherein the direction of motion of the

solenoid shaft is parallel to the axis of the exhaust air passageway;

(d) a plunger disposed within the housing and adapted for movement within the housing on an axis coinciding with the axis of exhaust air passageway;

(e) plunger seating means attached to the housing for forming an air-tight seal with the plunger when the solenoid is in the deenergized position;



(f) a coiled spring in compressive engagement with both the mounting means and the plunger and adapted for pressing the plunger against the plunger seating means when the solenoid is in the deenergized position;

(g) control rod means connecting the plunger to the solenoid shaft and adapted to pull the plunger away from engagement with the plunger seating means when the solenoid is energized.

4,557,186

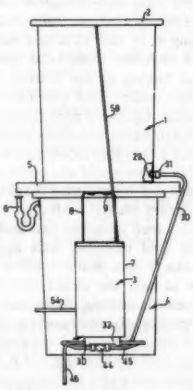
BREWING APPARATUS

Christopher J. L. Brown, Ipswich, England, assignor to Bowmans Brewer, Ltd., Suffolk, England

Filed Jun. 25, 1984, Ser. No. 624,288

Int. Cl.[4] C12C *9/00*

U.S. Cl. 99—278 **19 Claims**



1. Brewing apparatus for batch brewing beer or ale wherein a fermentation vessel is arranged to contain a quantity of liquor, a float hydrometer has a stem receivable within a sensor mounted in the vessel and arranged to limit upward displacement of said hydrometer, said sensor including means responsive to downward displacement of said hydrometer stem, and a controller connected to said sensor, the arrangement being such that, in use, with said vessel filled with liquor having a high specific gravity, said stem of said hydrometer is received within said sensor and, as the specific gravity of the liquor reduces due to fermentation, said hydrometer stem is displaced downwardly from said sensor until, at a desired specific gravity, said sensor means responds to provide a signal in said controller for indicating the desired completion of fermentation.

4,557,187

HOUSEHOLD APPLIANCE FOR PREPARING HOT BEVERAGES

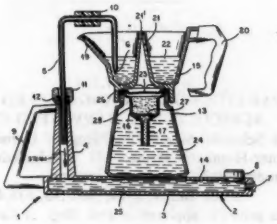
Luigi DePonti, Milan, Italy, assignor to Alfonso Bialetti & Co., Fonderia in Conchiglia S.p.A., Omegna-Crusinallo, Italy

Division of Ser. No. 593,039, Mar. 23, 1984, Pat. No. 4,516,484. This application Dec. 31, 1984, Ser. No. 687,980

Claims priority, application Italy, Mar. 23, 1983, 21234/83[U]; Apr. 15, 1983, 21565/83[U]

Int. Cl.[4] A47J *31/00*

U.S. Cl. 99—279 **6 Claims**



1. An appliance for preparing a hot beverage, comprising:

a generally flat hollow heatable boiling chamber for water to be contained therein and defining a flat surface forming a heat-transfer platform;

a vessel removably positioned on said platform so as to be heated thereby through a heat conductive wall of said vessel and adapted to contain a liquid;

filter means received in said vessel for supporting organic matter from which an infusion is brewed in said liquid to form said beverage;

an upwardly open receptacle removably mounted upon said vessel and forming a cover therefor;

conduit means rising from said platform adjacent said vessel and said receptacle and communicating with the interior of said chamber and provided with a gooseneck having a downwardly open nozzle positioned to overhang said vessel for discharging a heated fluid generated in said chamber into said receptacle.

4,557,188

RACK FOR COOKING FOODS SUCH AS ARTICHOKES

Denis Spanek, San Mateo, Calif., assignor to Chicago Wirecraft, Inc., Chicago, Ill., a part interest

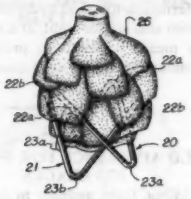
Filed Mar. 16, 1984, Ser. No. 590,158

Int. Cl.[4] A47J *27/04*

U.S. Cl. 99—415 **2 Claims**

1. A rack for steaming and cooking artichokes and other items formed of two separate lengths of rigid wire each of said lengths being substantially identical and bent at at least four acute angle prongs, said rack having a first end and a second end, there being at least two prongs at the first end and at least two prongs at the second end, the wires between the prongs being substantially straight and of equal length, whereby either end may rest on the bottom of a pan or on a dish to support the rack upright with the opposite end up to support the food item, said separate lengths of wire crossing and being in close prox-

imity at a plurality of intersections, said wire lengths being secured together at at least some of said intersections, whereby the artichoke is elevated above the surface on which said rack



rests with the stem up and leaves pointing down so that steam may rise up between the leaves, the prongs of the uppermost end penetrating under the leaves of the artichoke.

4,557,189

APPARATUS FOR BINDING ROLLED BALES OF AGRICULTURAL HARVESTED CROPS

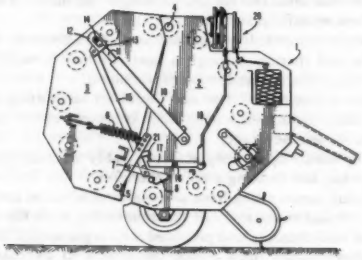
Siegfried Schaible, Singen, Fed. Rep. of Germany, assignor to Klockner-Humboldt-Deutz AG Zweigniederlassung Fahr, Gottmadingen, Fed. Rep. of Germany

Filed Jun. 1, 1984, Ser. No. 616,405

Claims priority, application Fed. Rep. of Germany, Apr. 13, 1984, 3414080

Int. Cl.[4] B65B *13/18*

U.S. Cl. 100—4 **15 Claims**



1. An apparatus for binding rolled bales of agricultural harvested crops, comprising at least one reel for holding twine, a twine guiding device for guiding a hank of twine along a surface of the bale to be bound and a control device for the twine guiding device, comprising a rope sheave and a set of gears, wherein the twine guiding device exhibits two spaced, pivotable twine guiding arms staggered with respect to one another and hinged to a cross rib frame member, each twine guiding arm having means for pivoting the respective arms in opposite directions by a connecting rod connected to said set of gears for moving the guiding arms from an initial position, in which the two twine guiding arms cross over one another and a middle area of the bale is bound, to an end position, in which the two ends of the bale are simultaneously bound, means for feeding twine from the reel and through the guiding device to a mechanism for wrapping the twine about the rolled bales, and driving means for moving the two twine guiding arms via said rope sheave and the set of gears by means of feeding of the twine.

4,557,190

APPARATUS FOR COMPACTING SCRAP MATERIALS, SUCH AS RELATIVELY COMMINUTED SCRAP METAL, WASTE, AND THE LIKE

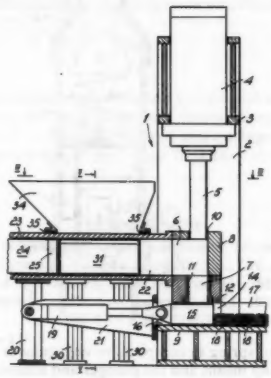
Luciano Vezzani, Ovada, Italy, assignor to Officine Vezzani S.p.A., Milan, Italy

Filed Mar. 14, 1984, Ser. No. 589,438

Claims priority, application Italy, Mar. 31, 1983, 20417 A/83

Int. Cl.[4] B30B *9/32*

U.S. Cl. 100—98 R **20 Claims**



1. An apparatus for compacting into blocks scrap materials, such as relatively comminuted scrap metal, waste and the like, comprising:

a feed chamber defining member for feeding therein pre-compressed material to be compacted into blocks, said feed chamber having an open ended tubular shape with a substantially vertical feed chamber axis and a side opening with a substantially horizontal feed inlet axis for feeding therethrough said pre-compressed material into said feed chamber, thereby to fill said feed chamber with said pre-compressed material,

a compression chamber defining structure located below said feed chamber and having a substantially vertical compression chamber axis coaxially in alignment with said feed chamber axis, said compression chamber defining structure including a tubular open ended die cavity defining die arranged in said structure and at the top of said compression chamber a die inlet opening into said feed chamber and having at the bottom of said compression chamber a die outlet, said die inlet and said die outlet being in coaxial alignment with said compression chamber axis, said compression chamber defining structure comprising further a movable closure element at said die outlet for removably closing said die outlet during compression therein of said pre-compressed material,

a compacting ram coaxial with said compression chamber axis and said feed chamber axis and vertically movable along said feed chamber axis and said compression chamber axis from a position above said chamber up to a position at said die outlet thereby to displace said pre-compressed material from said feed chamber into said compression chamber and simultaneously compress terein said pre-compressed material into a compacted block while said closure element is in a position closing said die outlet and expel said compacted block from said compression chamber through said die outlet when said closure element is moved away from said closing position thereof and

at least one pre-compression chamber located upstream of said feed chamber and extending substantially horizontally, one said pre-compression chamber being coaxial with said feed inlet axis and opening into said side opening

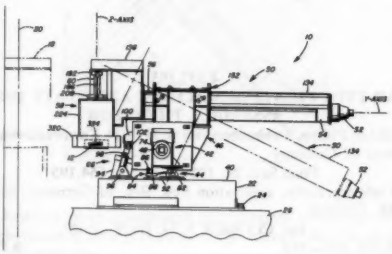
of said feed chamber, each said pre-compression chamber having a pressure element axially movable therethrough for partially pressing and displacing said pre-compressed material.

4,557,191

MULTIPLE MOVEMENT MARKING MACHINE

Edwin W. Speicher, Pittsburgh, Pa., assignor to M. E. Cunningham Company, Ingomar, Pa.

Filed Jul. 16, 1984, Ser. No. 631,192
Int. Cl.⁴ B41F *17/00*
U.S. Cl. 101—4 **14 Claims**



1. Apparatus for supporting a marking device for movement into and out of position for marking the surface of an object which is one of a plurality of said objects being moved along a path relative to said apparatus comprising,

a base including in a generally horizontal reference plane,

a lower support member positioned on said base, said lower support member having a surface extending in a first plane generally above said base,

a carriage mounted on said lower support member for movement in a preselected first direction parallel with said first plane and said horizontal reference plane,

first drive means drivingly connected to said carriage for said movement of said carriage to a preselected position on said lower support member,

an upper support member supported by said carriage for movement relative to said carriage in a second plane parallel with and a predetermined distance from said first plane in a preselected second direction which is transverse with respect to said preselected first direction,

second drive means drivingly connected to said upper support member for said movement of said upper support member to a preselected position relative to said carriage on said lower support member,

a marking device mounted on said upper support member for movement in a preselected third direction which is perpendicular to said first and said second planes to a preselected position relative to said upper support member, and

means for selectively tilting said lower support member about a first axis which is parallel to said horizontal reference plane, said tilting being relative to said base to adjust a relative position of said marking device out of said path of said plurality of said objects.

4,557,192

SELF RESTORING PIVOTING MEANS AND PRINT HAMMER USING SAME

William L. Dollenmayer, Versailles, Ky., assignor to International Business Machines Corporation, Armonk, N.Y.

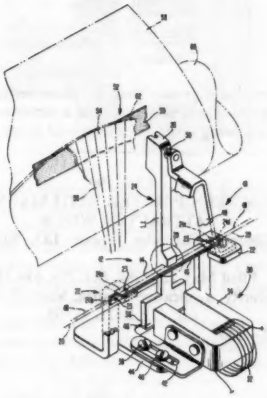
Filed May 26, 1981, Ser. No. 266,789
Int. Cl.⁴ B41J *9/127*
U.S. Cl. 101—93.48 **5 Claims**

1. In a printer comprising a platen for supporting a recording medium, typefont carrying means, a print ribbon interposed between said typefont carrying means and recording medium, a hammer head connected to a power arm pivotable in a vertical plane of motion from a rest position wherein said power arm is substantially vertically aligned to a print position to strike a character bearing print element of said typefont carrying means against said print ribbon and recording medium, pivoting means for pivoting said pivotable power arm including:

a frame fixed relative to said pivotable power arm;

a first elongated leaf spring located in a vertical plane perpendicular to said plane of motion with the longitudinal axis of said first leaf spring being horizontal and said first leaf spring having both extremities attached to said frame;

a second elongated leaf spring located in a horizontal plane



with its longitudinal axis being parallel to the longitudinal axis of said first leaf spring and having both of its extremities attached to said frame;

said first and said second elongated leaf springs being connected to and supporting said power arm;

actuating means for supplying a substantially horizontal force to said power arm for pivoting said power arm in said plane of motion from said rest position to said print position whereby said power arm flexes said first and second leaf springs in torsion; and,

restoring means for pivoting said power arm back to said rest position using the return torque of said leaf springs flexed in torsion.

4,557,193

PRINTING DEVICE

Sten I. Mattsson, Mörrum, Sweden, assignor to Facit Aktiebolag, Atvidaberg, Sweden

PCT No. PCT/SE82/00012, § 371 Date Aug. 27, 1982, § 102(e) Date Aug. 27, 1982, PCT Pub. No. WO82/02516, PCT Pub. Date Aug. 5, 1982
PCT Filed Jan. 15, 1982, Ser. No. 414,377
Claims priority, application Sweden, Jan. 19, 1981, 8100272
Int. Cl.⁴ B41J *9/04*
U.S. Cl. 101—93.48 **4 Claims**

1. A printing device, comprising:

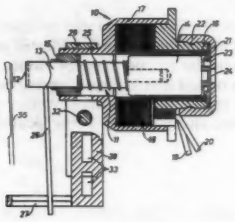
a housing;

an elongate cylindrical hammer that is axially translatable in said housing, said hammer having an impact surface at one end thereof;

a movable type carrier having a plurality of type characters each of which selectively cooperates with said impact surface to be centered thereby when said hammer engages said type carrier; and

means for preventing rotation of said hammer relative to said housing, including a guide pin mounted on said hammer adjacent said one end and extending generally perpendic-

ular from said hammer, and a guide slot extending parallel to the direction of translation of said hammer and being provided in said housing at a radial distance from said



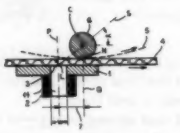
hammer that is greater than the diameter of said hammer at the point where said guide pin is mounted thereon, said guide pin being disposed within said guide slot.

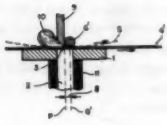
4,557,194

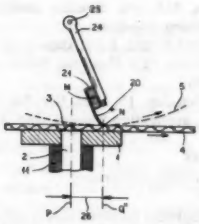
ROTARY-SCREEN PRINTER WITH MAGNETICALLY ATTRACTED WIPER

Johannes Zimmer, Ebentaler Strasse 133, 9020 Klagenfurt, Austria

Filed May 25, 1984, Ser. No. 614,412
Claims priority, application Austria, May 25, 1983, 1900/83
Int. Cl.⁴ B41L *13/06*
U.S. Cl. 101—120 **10 Claims**







1. In a printing apparatus wherein a cylindrical screen rotatable about a horizontal axis has a pattern of dyestuff-permeable perforations and touches a substrate, movable tangentially with the screen on an upper surface of an underlying support, along a line of contact determined by a mobile mass including a magnetically attracted wiper bearing upon the inner peripheral screen surface for forcing dyestuff through said perforations onto the substrate, said mass being at least partly magnetizable and being attracted toward the substrate by a bank of upright magnets having aligned pole faces flush with said upper surface bisected by a common midplane paralleling said axis,

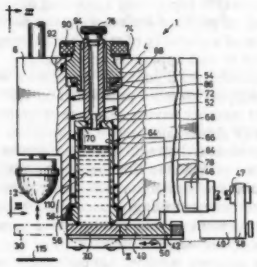
the improvement wherein said screen is displaceable relatively to said bank of magnets in the direction of rotation for separating said line of contact from said midplane by a distance stabilizing the position of the magnetically attracted wiper.

4,557,195

PAD-TYPE PRINTING MACHINE AND PLATE INKING ASSEMBLY THEREFOR

Wilfried Phlipp, Lenbachstrasse 8, D 7014 Kornwestheim, Fed. Rep. of Germany

Filed Sep. 24, 1984, Ser. No. 654,195
Claims priority, application Fed. Rep. of Germany, Sep. 29, 1983, 3335230
Int. Cl.⁴ B41K *3/54;* **B41F** *15/40*
U.S. Cl. 101—163 **8 Claims**



1. A pad-type printing machine having a mount and a cliché, ink means exhibiting a hollow body mounted thereon, whereby during the operation of the machine the end face of the hollow body rests at least occasionally on the cliché, pressing means for pressing the end face of the hollow body against the cliché, motion means for producing a relative motion between the cliché and the hollow body, whereby the hollow body is guided such that it can swivel about an axis extending basically parallel to the relative motion, and pad means adapted to be pressed onto the inked cliché and which accepts the ink from the recesses in the cliché and transfers it onto an object to be printed, wherein at least on some of the circumference of its end face (**96**) the hollow body (**64, 64a, 164, 264, 202**) exhibits hard material and is microfinished with a peak-to-valley height of at most 2 μm whereby the pressing means (**84, 88, 188, 238, 246**) for pressing the hollow body against the cliché (**30**) is designed such that the contact force acts in the immediate vicinity of the contact surface between the cliché and the hollow body and is at least approximately uniformly distributed over the circumference of the end face, whereby the hollow body is guided such that it can additionally swivel about an axis extending transversely to the relative motion between the cliché and the hollow body,

said hollow body (**202**) exhibiting parts (**204,210**) which are able to move in relation to each other and are joined together so as to be leak-tight in respect of liquids, whereby a part of the end face is provided on one part (**204**) of the hollow body and another part of the end face is provided on another part (**210**) of the hollow body.

4,557,196
PRINTING PLATE ATTACHMENT ARRANGEMENT

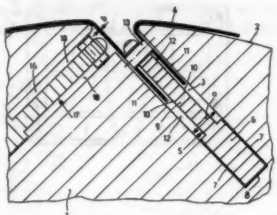
Ingo Köbler, Anhausen, Fed. Rep. of Germany, assignor to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Offenbach am Main, Fed. Rep. of Germany

Filed Nov. 26, 1984, Ser. No. 674,994

Claims priority, application Fed. Rep. of Germany, Dec. 15, 1983, 3345369

Int. Cl.⁴ B41F *1/28*

U.S. Cl. 101—415.1 **11 Claims**



1. Printing plate attachment arrangement to attach a thin, flexible printing plate (4) to a plate cylinder (1, 20) of a printing machine, wherein,

the plate cylinder is provided with two axially extending slits (18, 30) in its circumference to receive respective end portions of the printing plate,

comprising, in accordance with the invention,

a groove (3, 21) formed in the circumference of the plate cylinder (1, 20) at an acute angle to the surface of said cylinder and bounded by groove walls in the cylinder, the groove having a width (a) which is larger than twice the thickness (b) of the printing plate;

an insert strip (5, 23) retained in and axially movable within the groove (21) of the plate cylinder (20), said insert strip having

a guide portion (6, 24) located in the end region of the strip adjacent the inner zone (7, 32) of the groove, and engaging the walls of the groove,

an engagement and separating wall portion (9, 25), which is thinner than the guide portion, for receiving the end portions of a printing plate and defining the slits (18, 30) between the walls of the cylinder forming the groove and the engagement or separating wall portion of the insert strip; and

register elements (13, 31) secured to and projecting from the engagement or separating wall portion (9,25) of the insert strip and securing end portions of said printing plate in a desired axial position against axial slippage within said groove.

4,557,197
PYROGEN IGNITER

James O. Smith; Ronald F. Vetter, and George F. Sieg, all of Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 30, 1984, Ser. No. 595,208

Int. Cl.⁴ F42C *19/12*

U.S. Cl. 102—202 **13 Claims**

1. A pyrogen igniter comprising:

an electrically conductive housing, said housing having an open neck portion and an open base portion;

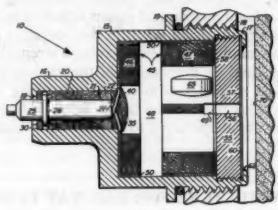
an insulator sleeve mounted in said neck portion of said housing;

an electrically conductive pin mounted in said insulator sleeve, said pin protruding from said neck portion of said housing;

an electrically conductive bridgewire, said bridgewire mounted in said neck portion of said housing, said bridgewire providing an electrical path between said housing and said pin;

a prime igniter charge, said charge introduced into said neck portion of said housing as a slurry, said slurry solidifying in said neck portion around said bridgewire with the result that said bridgewire is embedded in said prime igniter charge;

a nozzle plate having an exterior face and an interior face and defining an exhaust orifice of predetermined diameter, said nozzle plate mounted in said base end of said housing, said



nozzle plate focusing the output of said igniter as a gas jet and shielding the interior of said igniter from external pressure and temperature fluctuations; and

an igniter main charge mounted in said base portion of said housing, said igniter main charge including a booster portion juxtaposed said prime igniter charge and a sustainer portion juxtaposed said nozzle plate, said igniter main charge defining a reaction chamber within said housing, said reaction chamber communicating with said prime igniter charge and said exhaust orifice defined by said nozzle plate.

4,557,198
SAFETY DEVICES FOR CARRIER SHELLS

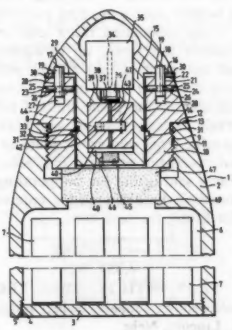
Dennis J. Hickey, Accrington, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Feb. 22, 1983, Ser. No. 468,596

Claims priority, application United Kingdom, Mar. 4, 1982, 8206383

Int. Cl.⁴ F42B *41/00*

U.S. Cl. 102—481 **22 Claims**



1. A carrier shell for carrying and dispersing a plurality of secondary projectiles comprising:

a shell casing having a venting aperture defined therein;

a plurality of secondary projectiles contained within the casing;

an explosive dispersal charge contained within the casing for dispersing the secondary projectiles from the casing after firing and venting only through said venting aperture in

the event of explosion prior to firing from the shell of a gun;

a safety device having a body which closes the venting aperture;

first restraining means including a first mechanical means for securing the body to the shell casing and having a strength such that it will yield on detonation of the explosive charge; and

second restraining means having an operative and an inoperative condition, said second restraining means being ineffective to secure the body to the shell casing when in the inoperative condition, said second restraining means including a second mechanical means effective to secure the body to the shell casing when in the operative condition, said second mechanical means having a strength such that it will not yield on detonation of the explosive dispersal charge, said second restraining means being responsive only to forces generated on firing the shell from a gun to move from the inoperative to the operative condition.

4,557,199

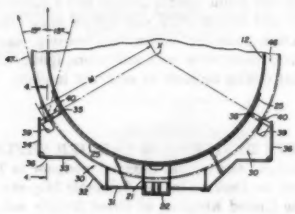
LIFTING STRUCTURE FOR RAILWAY TANK CAR

John E. Everett, Jr., Sharpsville, Pa., assignor to General American Transportation Corporation, Chicago, Ill.

Filed Jul. 25, 1983, Ser. No. 516,683

Int. Cl.[4] B61K *5/00;* **B61D** *5/00*

U.S. Cl. 105—362 **3 Claims**



1. Lifting structure for a railway tank car including a generally cylindrical tank having a longitudinal axis, and trucks located adjacent the opposite ends of the tank, with each truck carrying a tank-supporting underframe which includes part-cylindrical slabbing extending circumferentially along the outer surface of the bottom of the tank, said lifting structure comprising: a bolster plate extending radially outwardly from the slabbing to the associated truck and having a top edge spaced well above the truck, an upwardly opening notch formed in said top edge of said bolster plate, a cover plate extending along the outer edge of said bolster plate substantially perpendicular to the plane thereof and projecting upwardly above said top edge thereof, and a lifting lug extending along said top edge from said cover plate to the slabbing and fixedly secured to said bolster plate and closing the open upper end of said notch, said lifting lug cooperating with said notch to define an opening dimensioned for receiving an associated lifting hook for lifting the tank car.

4,557,200

TRAY WITH FOLDING LEGS

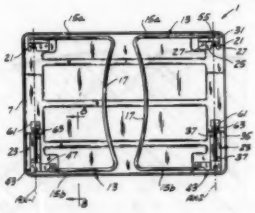
Robert C. Geschwender, Lincoln, Nebr., assignor to New Products I, Ltd., Lincoln, Nebr.

Filed Aug. 15, 1983, Ser. No. 523,167

Int. Cl.[4] A47B *3/00;* **F16M** *11/38*

U.S. Cl. 108—132 **18 Claims**

1. A generally rectangular tray having a pair of legs pivoted on the underside of the tray at opposite sides thereof for swinging between a folded position in which the legs are folded up adjacent the underside of the tray and an unfolded position in which the legs extend down from the tray for supporting it, each leg having spaced apart side portions interconnected for resilient springing movement of the side portions with respect to one another, latches on the underside of the tray for releasably latching the legs in folded position, and actuator means on the tray engageable with said legs and operable by a person while holding the tray in a serving position for springing the side portions of each leg with respect to one another thereby to disengage the legs from their respective latches for enabling the legs to swing down by gravity from their folded position to



their unfolded position for supporting the tray, said actuator means comprising a pair of actuators movably mounted on said opposite sides of the tray and positioned generally midway of respective sides whereby said actuators may be moved by hand while holding the tray in said serving position with both hands positioned generally midway of said opposite sides thereby to spring respective side portions of respective legs with respect to one another.

4,557,201

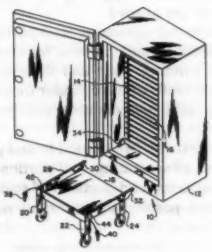
APPARATUS FOR STORAGE AND TRANSPORTATION OF JEWELRY DISPLAY TRAYS

James V. Webb, Jr., Carrollton, Tex., assignor to Jeweler's Safe Company, Inc., Carrollton, Tex.

Filed Nov. 14, 1983, Ser. No. 551,178

Int. Cl.[4] E05G *1/00*

U.S. Cl. 109—45 **16 Claims**



1. Apparatus for the storage and transportation of jewelry display trays comprising in combination:

storage rack means having a plurality of apertures for receiving jewelry display trays;

a closable vault having an interior cavity suitable for receiving said storage rack means;

a structural member disposed within said interior cavity of said vault having at least one exposed edge;

transport means having an upper surface suitable for supporting said storage rack means;

a structural extension of said transport means having at least one exposed edge adapted to be mated with said structural member within said interior cavity of said vault wherein said transport means may be aligned in a selected position with respect to said interior cavity of said vault whereby said storage rack may be easily moved from said interior cavity to said transport means; and

means for selectively coupling said storage rack means to the upper surface of said transport means wherein said storage rack means may be selectively transported by means of said transport means.

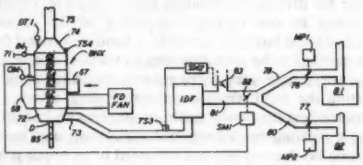
4,557,202
EXHAUST GAS TREATMENT METHOD AND APPARATUS

Donald F. Warner, Latham, N.Y., assignor to Heat Exchanger Industries, Inc., Latham, N.Y.

Continuation-in-part of Ser. No. 252,297, Apr. 9, 1981, abandoned, and a continuation-in-part of Ser. No. 81,789, Oct. 4, 1979, abandoned. This application Aug. 10, 1982, Ser. No. 406,772

Int. Cl.⁴ F23J *3/00*

U.S. Cl. 110—216 **44 Claims**



1. Apparatus for recovering heat energy from an exhaust gas which contains water vapor and sulfur trioxide, comprising, in combination; means defining a gas-passage housing; a plurality of tubes extending generally horizontally through said gas passage housing at a plurality of different levels, the exterior surfaces of said tubes within said gas passage housing carrying corrosion-protection coverings; means for applying said exhaust gas to said gas passage housing for flow of said exhaust gas generally perpendicularly to and between said tubes and through said housing; means for passing a fluid to be heated which is initially cooler than the dew point of said water vapor through successive ones of said tubes, thereby causing continuous condensation of water vapor and sulfuric acid and a continuous washing of a group of lower tubes in said housing, said gas passage housing comprising a pair of spaced-apart tube sheets each having a plurality of holes, a plastic corrosion-protection material covering the inside of each tube sheet and extending through each of the holes in the tube sheet, said tubes extending through pairs of holes in said tube sheets, said plastic corrosion-protection material extending through said holes gripping the corrosion-protection material on the exterior surfaces of said tubes.

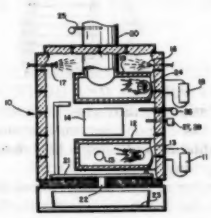
4,557,203
METHOD OF CONTROLLING A RECLAMATION FURNACE

Kenneth R. Mainord, Farmers Branch, Tex., assignor to Pollution Control Products Co., Dallas, Tex.

Filed Aug. 13, 1984, Ser. No. 640,393

Int. Cl.⁴ F23J *3/00*

U.S. Cl. 110—344 **12 Claims**



1. In a reclamation furnace having a primary heat-input burner connected to a combustion chamber, internal structure within the furnace for supporting reclaimable contaminated parts, a secondary burner connected to an afterburner chamber having an exhaust gas stack, said secondary burner and afterburner chamber combinedly comprising an afterburner for burning contaminants, the afterburner chamber being located within the furnace along with said internal structure for supporting reclaimable parts, a method for controlling the atmosphere and temperature within said reclamation furnace comprising the steps of:

(a) heating said contaminated parts within said furnace with a continuously-operated primary heat-input burner;

(b) controlling the air-fuel combustion mixture delivered to said primary heat-input burner to maintain a relatively low oxygen level;

(c) burning combustible gases emitted from said heated contaminated parts within said afterburner chamber with a continuously-operated secondary burner;

(d) continuously sensing within both said exhaust gas stack and said furnace prescribed ranges of low and high set-point temperatures of the burned stack gases and the interior of the said furnace;

(e) actuating the injection nozzle of a first separately-controlled water-injection system when the prescribed low-level set-point temperature of stack gases or the high-level set point temperature of said furnace is exceeded to inject a first water-spray into said furnace to cool the interior thereof;

(f) actuating the injection nozzle of a second separately-controlled water-injection system when the prescribed high-level set-point temperature of said stack gases or the low-level set-point temperature of said furnace is exceeded to inject a second water-spray into said furnace to cool the temperature within said furnace, and

(g) discontinuing operation of either or both of said separately-controlled water-injection systems when temperatures below the prescribed low-level set-point temperatures of both said stack gases and said furnace are attained to discontinue water-spray injection into said furnace to thereby cease cooling of said heated parts.

4,557,204
PROCESS AND APPARATUS FOR TREATING WASTE MATERIALS

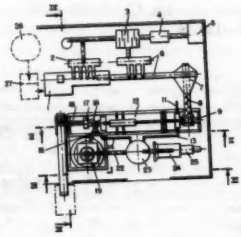
Erich Faehnle, Aalen/Unterkochen, Fed. Rep. of Germany, assignor to PKA Pyrolyse Kraftanlagen GmbH, Aalen, Fed. Rep. of Germany

Filed May 16, 1984, Ser. No. 610,679

Claims priority, application Fed. Rep. of Germany, May 18, 1983, 3317985; Dec. 30, 1983, 3347554

Int. Cl.⁴ F23G *5/02*

U.S. Cl. 110—346 **12 Claims**



1. In a process in which a feed material of household, industrial and the like refuse is introduced into a low temperature carbonization reaction and the resultant reactant gas and residue are separately recovered, the improvement which comprises introducing said feed material into said reaction in par-

ticulate form in which the particle size is in a range of 1.0–50 mm having a dry substance content greater than 70%.

4,557,205

FUR SEWING MACHINE WITH HEATED AIR BLOWER

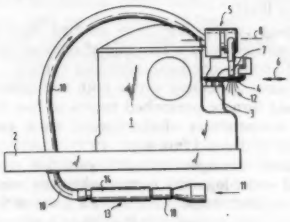
Alfons Strobel, Grunwald; Hans Wagner, and Georg Hauser, both of Munich, all of Fed. Rep. of Germany, assignors to J. Strobel & Sohne GmbH & Co., Fed. Rep. of Germany

Filed Aug. 20, 1984, Ser. No. 642,159

Claims priority, application Fed. Rep. of Germany, Aug. 26, 1983, 3330877

Int. Cl.[4] D05B *23/00*

U.S. Cl. 112—20 **10 Claims**



1. A fur sewing machine with a blowing arrangement for deflecting the hairs of fur pieces from the area being sewn, which blowing arrangement comprises a blower device, a source of compressed air, a connecting line between the source of compressed air and the blower device for supplying compressed air to the blower device, the blower device being mounted on the sewing machine so as to enable discharge of the compressed air in a direction that deflects the hairs of the fur pieces in the area being sewn, a heating device disposed in the connecting line for heating the compressed air, the heating device including a pipe fitting, the pipe fitting having a pipe portion and fittings at each end thereof for engaging the connecting line so that compressed air may flow through the pipe fitting, a helical electric resistance heater disposed within the pipe fitting, which resistance heater is coaxial with the pipe fitting and extends between the ends thereof.

4,557,206

SEWING MACHINE FOR QUILTS AND THE LIKE

Hideo Iwase, Tokyo, Japan, assignor to Prince Mishin Kabushiki Kaisha, Tokyo, Japan

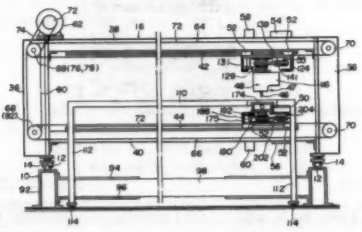
PCT No. PCT/JP83/00054, § 371 Date Sep. 30, 1983, § 102(e) Date Sep. 30, 1983, PCT Pub. No. WO83/02966, PCT Pub. Date Sep. 1, 1983

PCT Filed Feb. 23, 1983, Ser. No. 551,988

Claims priority, application Japan, Feb. 23, 1982, 57-27849

Int. Cl.[4] D05B *3/00*

U.S. Cl. 112—121.14 **4 Claims**



1. In a sewing machine in which a frame which is moved by to-and-fro feed means is provided to be movable forwards and backwards along guide means mounted to a base; an arm unit and a base unit of a sewing machine body are mounted to the frame in such a manner that the arm unit and the base unit are respectively supported and guided by a pair of horizontal upper and lower guide members, which are mounted to the frame and disposed vertically, to be laterally movable, the arm unit having a head and the base unit having a rotating hook complete and being separate from the arm unit; the arm unit and the base unit are moved by lateral feed means laterally and synchronously with each other along the guide members; and a supporting bed for supporting an article to be sewed is disposed between the arm unit and the base unit of the sewing machine body so that the supporting bed passes between the guide members, the improvement which comprises:

means mounted to the arm for driving the head, the driving means including a head driving motor; and means mounted to the base unit and having a rotating hook complete drive motor for driving the rotating hook complete; the arm unit including an arm carriage supported on the upper guide member to be laterally movable, a head suspended from the arm carriage to be rotatable about a vertical axis, and means mounted to the arm carriage and including a motor for rotating the head; the base unit including a base carriage supported on the lower guide member to be laterally movable, a rotating hook complete supporting unit having the rotating hook complete and mounted to an upper portion of the base carriage to be rotatable about a vertical axis, and means mounted to the base carriage and having a motor for rotating the rotating hook complete supporting unit; and said head drive motor and the rotating hook complete drive motor being mounted to the arm carriage and the case carriage respectively.

4,557,207

METHOD AND APPARATUS FOR IMPROVED AUTOMATIC STITCHING

Vernon S. Turner, Arvada, and Randall Melton, Brighton, both of Colo., assignors to Melco Industries, Inc., Denver, Colo.

Filed Feb. 13, 1984, Ser. No. 579,310

Int. Cl.[4] D05B *21/00*

U.S. Cl. 112—266.1 **5 Claims**

MICROFICHE APPENDIX INCLUDED

(2 Microfiche, 100 Pages)

1. A method of stitching different characters using common stitch parameters based upon operator selection of the desired characters to be stitched and using a keyboard having a number of keys, comprising:

providing a number of style storage areas, each of said style storage areas for receiving a number of different stitch parameters without accompanying characters;

forming a plurality of styles including a first style, each style being defined by a number of stitch parameters;

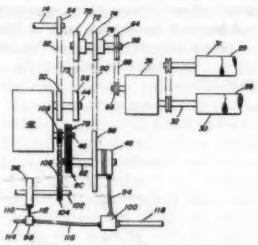
identifying each of said styles;
storing each of said styles in a different one of said style storage areas and without storing any character in said style storage areas using the identity of each of said styles;
recalling said first style having a number of stitch parameters from said style storage areas;
after forming said first style, selecting a first character to be stitched using the keyboard;
applying said stitch parameters of said recalled first style to said first selected character;
stitching said first selected character using said stitch parameters of said recalled first style;
selecting a second character to be stitched using the keyboard;
applying said stitch parameters of said first style to said second selected character; and
stitching said second selected character using said stitch parameters of said first style.

4,557,208

METHOD AND APPARATUS FOR TUFTING PATTERNED FABRIC

Gary L. Ingram, Ooltewah, and Ian Slattery, Hixson, both of Tenn., assignors to Spencer Wright Industries, Inc., Chattanooga, Tenn.

Filed Sep. 24, 1984, Ser. No. 653,290
Int. Cl.[4] D05C *15/00*
U.S. Cl. 112—266.2 **20 Claims**



1. In the method of forming a tufted pile fabric by a tufting machine having a bank of yarn carrying needles reciprocably driven by a rotating main shaft, and feed means including a control shaft drivably connected to said main shaft for feeding a backing material in a longitudinal direction for penetration thereof by the needles to insert longitudinal rows of successive yarn tufts therein, said tufts projecting from one surface of said backing and connected in each row by backstitches on the opposite surface of said backing, the improvement comprising, rotating said control shaft at a first rate for feeding the backing material through the machine at a first speed while forming tufted pile having a backstitch of a first length, and selectively increasing the rotational rate of the control shaft to increase the backing material feeding speed to a second speed to form a tufted pile having a backstitch longer than said first length.

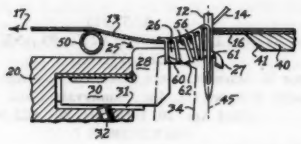
4,557,209

SCULPTURED HIGH-LOW CUT PILE TUFTING METHOD AND APPARATUS

Charles W. Watkins, Ooltewah, Tenn., assignor to Tuftco Corporation, Chattanooga, Tenn.

Filed Jul. 13, 1984, Ser. No. 630,496
Int. Cl.[4] D05C *15/00*
U.S. Cl. 112—266.2 **14 Claims**

1. The method of tufting high and low cut pile in a base fabric moving longitudinally in a normal path, comprising the steps of:
(a) stitching a series of yarn loops at a stitching station successively through the base fabric as the base fabric moves longitudinally,
(b) seizing each yarn loop with a looper hook as the loop is stitched,
(c) successively cutting each yarn loop upon the looper hook,
(d) supporting the base fabric only as it moves toward the stitching station and at the stitching station, to provide an



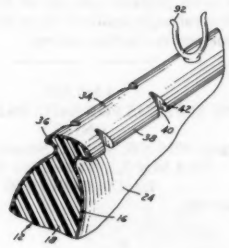
unsupported portion moving away from said stitching station,
(e) selectively feeding a short length or a long length of yarn to the stitching station so that when a short length of yarn is seized, the unsupported portion of the base fabric is drawn toward the looper hook to create a short loop, and when a long length of yarn is seized, the base fabric remains in its normal path to create a long loop.

4,557,210

TWIN HULL DISASSEMBLABLE ROWBOAT

Jeffrey A. Gerwin, Gerwin Marine Company, Inc., 150 E. 58th St., New York, N.Y. 10155, assignor to Jeffrey A. Gerwin, New York, N.Y.

Filed Mar. 30, 1984, Ser. No. 595,427
Int. Cl.[4] B63B *5/24*
U.S. Cl. 114—56 **29 Claims**



1. A twin hull disassemblable rowboat comprising:
(a) a pair of generally identical elongated unitary buoyant hulls made from plastic material, said hulls being arranged and spaced side by side in parallel relation;
(b) said hulls each having a bottom surface, a top surface and a pair of side surfaces;
(c) said top surface having a pair of longitudinal edges and a series of longitudinally spaced notches;
(d) a pair of tubular sleeves on each hull adjacent to the bow and stern, with the bow sleeve in one hull being transversely aligned with the bow sleeve in the other hull and the stern sleeve in one hull being transversly aligned with the stern sleeve in the other hull;
(e) a flexible deck spanning the space between said hulls and having at one pair of edges elongated tubular sleeves and at the other pair of edges a plurality of longitudinally spaced fastening eyelets corresponding generally to and aligned with the notches in the opposing hull;
(f) a pair of elongated spars extending through the corresponding deck sleeves, with the ends thereof extending beyond said deck sleeves and being respectively received

in and carried by said pairs of aligned bow and stern sleeves;

(g) removable tension means interposed between the eyelets of said flexible deck and said notches on the top surfaces of said hulls; and

(h) removable pin fastening means extending through said bow and stern sleeves and the ends of said spars to maintain said deck and said hulls in assembled relation.

4,557,211

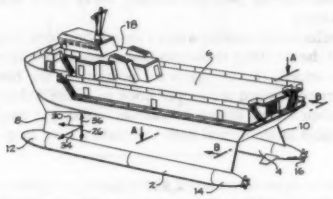
FORM STABILIZED LOW WATER PLANE AREA TWIN HULL VESSELS

Terrence W. Schmidt, Santa Clara, Calif., assignor to Lockheed Missiles & Space Co., Inc., Sunnyvale, Calif.

Filed Apr. 20, 1984, Ser. No. 602,440

Int. Cl.[4] B63B *1/12*

U.S. Cl. 114—61 **2 Claims**



1. A form stabilized low water plane area twin hull vessel comprising: a pair of substantially tubular shaped parallel hulls that provide buoyancy support for the vessel, a pair of dihedral struts connected to said pair of parallel hulls and adapted to support an upper hull, and an upper hull connected to said pair of dihedral struts, wherein said pair of dihedral struts form a negative dihedral angle with said upper hull and wherein said struts include positive section camber.

4,557,212

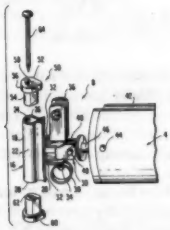
BEARING SYSTEMS FOR SAILCRAFT GOOSENECK UNITS

John Hackney, 1026 NW. 16th St., Stuart, Fla. 33494

Filed May 7, 1984, Ser. No. 607,566

Int. Cl.[4] B63B *15/00*

U.S. Cl. 114—98 **2 Claims**



1. A bearing system for the gooseneck unit of a sailcraft boom wherein said gooseneck unit includes:

an elongated slide member having

a fore side,

an aft side,

an external surface contoured to slide vertically in a longitudinal track that extends verticaliy on the aft side of the mast of said sailcraft and

an internal longitudinal channel that extends from end to end of said slide member, and

pivot means extending from said aft side of said slide member by which said sailcraft boom is supported by said slide member to swing horizontally aft of said mast,

said bearing system comprising:

a first bearing member having

a first portion contoured to telescope into said channel of said slide member and

a second portion integral with said first portion and contoured to slide vertically along said track on the aft side of said mast, and

a bore extending longitudinally and approximately centrally through said first and second portions,

the cross-section of said second portion being larger than the cross-section of said first portion whereby said first portion can enter said channel while said second portion can not,

a second bearing member that is substantially identical to said first bearing member except that the bore of said second bearing member is smaller in cross-section than the bore of said first bearing member, and

a screw with a diameter and length that permits it to slide through said bore of said first bearing member and to thread into said bore of said second bearing member when said bearing members are fitted into opposite ends of said channel of said slide member.

4,557,213

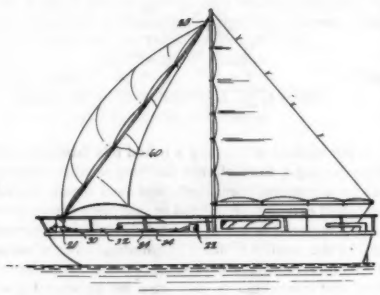
APPARATUS FOR FURLING SAILBOAT JIB

Charles Maier, Port Clinton, Ohio, assignor to James R. Longacre and Richard Hendricks, both of Washington, D.C.

Filed Oct. 15, 1984, Ser. No. 660,990

Int. Cl.[4] B63H *9/10*

U.S. Cl. 114—106 **9 Claims**



1. An apparatus for furling a sailboat jib about a forestay attached at one end to the deck and at the other end to a mast from a main cockpit comprising:

a sleeve adapted for being mounted for rotation about said forestay and for attachment on the exterior surface thereof to said jib;

rotary actuator means coupled to said sleeve for rotating said sleeve to furl said jib and adapted for attachment to the sailboat deck adjacent the attachment of said forestay;

a gear box adapted for attachment to said sailboat near said main cockpit and at a location remote from the location of said rotary actuator and having gears therein for manual rotation; and

means including a flexible shaft extending non-linearly along the deck from said rotary actuator means to said gear box for coupling said gear box to said rotary actuator means so that rotation of said gears within said gear box rotates said actuator means and sleeve to furl said jib by manual operation from said main cockpit.

4,557,214

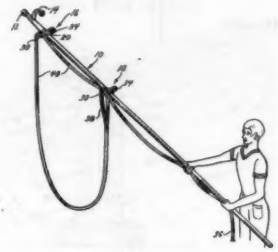
ROPE-HOLDING BOAT HOOK

Jerome A. Molitor, 13423 Land O Woods, Creve Coeur, Mo. 63141

Continuation of Ser. No. 419,959, Sep. 20, 1982, abandoned. This application Aug. 20, 1984, Ser. No. 642,694

Int. Cl.⁴ B63B *21/54*

U.S. Cl. 114—221 R **5 Claims**



1. Boat hook having an elongated shaft and independent rope supporting members connected to the shaft in a manner enabling the distance between the supporting members to be adjusted, each rope supporting member having a shank portion that projects generally radially outwardly relative to a longitudinal axis of the shaft and an outer end portion extending from the shank portion in a direction projecting out of a plane containing said shank portion and the elongated shaft such that, with said boat hook positioned with the shank portions oriented in a generally horizontal direction and the end portions oriented in a generally vertical direction, said shank portions form a means for longitudinally and vertically supporting a looped end of a rope draped thereover from shifting relative to the elongated shaft, said outer end portions form a means for supporting the looped end of the rope from shifting longitudinally and radially of the elongated shaft, and said rope supporting members are operable to release the looped end portions solely by rotation of the elongated shaft about the longitudinal axis thereof, wherein at least one of the rope supporting members is connected to the shaft by a collar that substantially encircles the shaft and is displaceable longitudinally along the shaft for adjusting the distance between the rope supporting members.

4,557,215

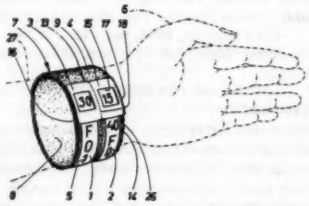
DEVICE FOR INDICATING THE CURRENT SCORE WHEN PARTICIPATING IN SPORT

Bengt Petersson, Stutaliden 33, S-434 00 Kungsbacka, Sweden

Filed Oct. 6, 1983, Ser. No. 539,425

Int. Cl.⁴ A63B *71/06*

U.S. Cl. 116—222 **3 Claims**



1. A device to be worn by an individual participating in sport, athletics or other physical activity for indicating a current score or similar information, comprising a main part of a soft, flexible, moisture-absorbent material serving as a sweatband in the form of an annular loop having a circumference, and to be worn around a part of the body of the individual, said sweat-band including a backing layer, a covering layer, and at least one read-off window affixed to said covering layer, a number of annular indicator bands disposed between the backing layer and the covering layer over a portion of their length, said number of indicator bands corresponding to the number of read-off windows and provided with a number of symbols for indicating the score, said indicator bands being movable in relation to the read-off windows so that different symbols can be advanced to a position so as to be viewable through the respective read-off window, said covering layer being open at two locations for exposing the indicator bands over a distance allowing gripping of the bands for moving said indicator bands relative to the read-off windows.

4,557,216

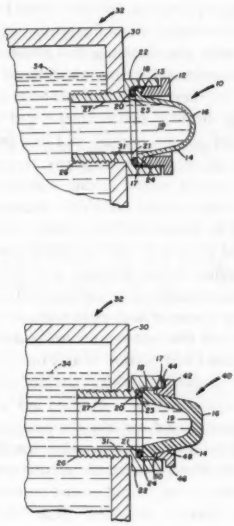
SAFETY SIGHT

Thomas R. Demyon, Safety-Sight, Inc., 2197 Green Spring Dr., Timonium, Md. 21093

Continuation-in-part of Ser. No. 407,176, Aug. 11, 1982, abandoned, which is a continuation of Ser. No. 194,945, Oct. 8, 1980, abandoned, which is a continuation-in-part of Ser. No. 90,705, Nov. 2, 1979, abandoned, which is a continuation of Ser. No. 972,731, Dec. 26, 1978, abandoned. This application Oct. 11, 1983, Ser. No. 540,655

Int. Cl.⁴ G01F *23/02*

U.S. Cl. 116—227 **4 Claims**



1. A four piece safety sight device for detecting the liquid level in a container for liquids, comprising:

a body means, said body means consisting of a main body structure, said main body structure having an internal passageway therethrough, said main body structure having a first portion and a second portion, said first portion having a tapered external screw thread on the exterior thereof, said second portion having an external nut-like shoulder, said nut-like shoulder being configured for a standard nut wrench on the exterior thereof, said nut-like being on its outside wider than the outside diameter of said first portion, said second portion having a counter-bored recess, said counter-bored recess being located in one end of said internal passageway within said second portion, said counter-bored recess having an internal thread therein, said counter-bored recess providing an internal

shoulder therein, said first portion being threadably and removably inserted in a tapered inside thread of an aperture in a wall of said container for liquids, said threaded first portion being of a length to extend through the wall of said container for liquids and into the inside of said container for liquids;

a sight window means, said sight window means being configured as an elongated bulb-like member, said elongated bulb-like member being closed at one end and open at the other end to form a cone shaped cavity with rounded apex and no angle breaks therein, said elongated bulb-like member having an exterior surface, said elongated bulb-like member having an exterior shoulder formed with a concave surface encircling said elongated bulb-like member at the end thereof which is open, said exterior shoulder of said sight window means being the distal end thereof, said exterior surface of said elongated bulb-like member being conical-like and paralleling the inside surface of said cone-shaped cavity, said sight window means being removably affixed to said body means whereby said exterior shoulder on said elongated bulb-like member is removably inserted within said counter-bore, said closed end of said elongated bulb-like member thereby projecting substantially from said counter-bore to the exterior thereof;

a one single seal means, said seal means being an O-ring type seal and toroidal in configuration, said seal means being removably placed within said counter-bored recess and located upon said internal shoulder of said counter-bored recess and thereby between said body means and said sight window means in said counter-bored recess; and

a one piece retainer means, said one piece retainer means having an internal passageway therethrough, said one piece retainer means having a first end portion and a second end portion, said first and second end portions having an inward and an outward end, respectively, said first end portion of said one piece retainer means having an external thread thereon, said external thread being capable of mating with said internal thread in said counter-bore recess of said main body structure, said inward end of said first end portion being the distal end thereof, said second end portion of said one piece retainer means having an external nut-like shoulder, said nut-like shoulder being configured for a standard nut wrench on the exterior thereof, said nut-like shoulder on said second end portion being on it outside wider than the outside diameter of said first end portion of said one piece retainer means, said outward end of said second portion being the exterior surface thereof, said one piece retainer means being threadably and removably affixed to said body means by insertion into said counter-bore recess to mate with said internal thread in said counter-bore recess so as to couple and compact said body means, said seal means, and said sight window means together as a tightly sealed unit, said distal end of said first end portion of said one piece retainer means including a convex surface portion contacting directly with said concave surface of said exterior shoulder on said bulb-like member when compactly assembled therewith, said single seal means being sealably compacted between said internal shoulder of said counter-bore recess and said distal end of said sight window means, said elongated bulb-like member of said sight window means extending and protruding extensively through said retainer means and beyond said exterior surface thereof.

4,557,217

APPLICATOR FOR "CURTAIN-TYPE POURING" OF MOLTEN PLASTICS AND THE LIKE POURABLE MATERIALS

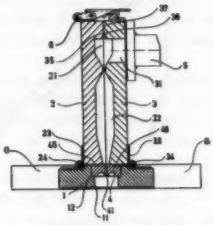
Hanskonrad Zingg, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Aug. 9, 1984, Ser. No. 639,041

Claims priority, application Switzerland, Aug. 19, 1983, 4534/83

Int. Cl.⁴ B05B *1/04*

U.S. Cl. 118—300 **4 Claims**



1. An applicator for curtain-type pouring of pourable plastics or the like material, comprising

two half shells having each an upper end and a lower end and constituting, when both in upright closed position, an applicator head having distributor channel means therein,

a base plate having an elongated recess therein extending along a longitudinal recess axis,

said two half shells being supported, at their lower ends, on said base plate, on opposite sides of said recess, and being articulatedly connected with said base plate for pivotal movement about axes extending parallel with said longitudinal recess axis, between said closed position, of said two half shells, and an open position in which said half shells are spread apart; and

an applicator die block lodged firmly but removably in position in said recess of said base plate and having a slit-shaped orifice adapted for pouring molten plastics or the like material from said distributing channel means therethrough to emerge as a curtain, said slit-shaped orifice extending substantially along said longitudinal recess axis;

said two half shells, when in closed position being at their lower ends in sealing contact with said applicator die block, and, when in open position, being spread apart far enough to permit removal or replacement of said applicator die block.

4,557,218

DEVICE FOR CONTINUOUS APPLICATION OF FOAM ONTO A FLAT STRUCTURE

Erich Sievers, Bremen, Fed. Rep. of Germany, assignor to Manfred Kupfer, Gross Ippener, Fed. Rep. of Germany

Filed May 21, 1984, Ser. No. 612,353

Claims priority, application Fed. Rep. of Germany, May 21, 1983, 3318711

Int. Cl.⁴ B05C *5/02*

U.S. Cl. 118—612 **25 Claims**

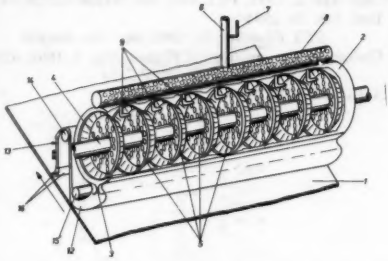
1. An apparatus for applying a continuously manufactured foam made of a mixture of foamable material and operating gas to a flat structure to be coated thereby, comprising:

a generally cylindrical container for the manufactured foam disposable directly above the flat structure, said container having a lower side facing the structure which is provided with a rim defining a slit-like opening for the discharge of said foam, the length of said slit-like opening corresponding to the desired coating width;

a plurality of supply conduits communicating with said

container for passing therethrough a mixture comprising a foamable material and operating gas;

a plurality of mechanically-operating foaming elements mounted in said container for producing foam therein from said mixture of foamable material and operating gas, each of said foaming elements each including an apertured



disk having a plurality of openings formed therethrough and having an arcuate dish-like form, at least in its outer peripheral region; and

a concentrically disposed drive shaft rotatably mounted in said cylindrical container and on which said foaming elements are disposed for rotation therewith.

4,557,219

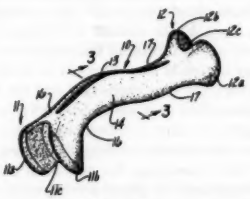
CHEWABLE TOY FOR ANIMAL

Philip L. Edwards, 14615 Klenk, Detroit, Mich. 48215

Division of Ser. No. 540,987, Oct. 11, 1983, Pat. No. 4,513,014. This application Oct. 26, 1984, Ser. No. 665,410

Int. Cl.⁴ A01K *29/00*

U.S. Cl. 119—29.5 **11 Claims**



11. The method of manufacturing a flavored polyurethane chewable toy for an animal, the steps of

(a) initiating an exothermic reaction by thoroughly mixing measured quantities of separate compositions including an isocynate composition (R—N═C═O) and a hydroxyl composition (R—OH) capable of polymerization to a polyurethane having predetermined physical characteristics,

(b) thoroughly mixing in said exothermic reaction a measured quantity of a surface-migrating flavoring extract incompatable with the polymerized polyurethane,

(c) curing the mixture by allowing polymerization of said composition to said polyurethane, and

(d) molding the polyurethane to form said chewable toy.

4,557,220

GAS APPARATUS FOR PRODUCING HOT WATER

Theo Jannemann, Dorsten, and Horst Brünje, Rellinghausen, both of Fed. Rep. of Germany, assignors to Ruhrgas Aktiengesellschaft, Essen, Fed. Rep. of Germany

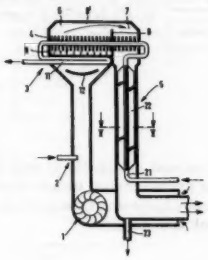
PCT No. PCT/DE83/00076, § 371 Date Dec. 27, 1983, § 102(e) Date Dec. 27, 1983, PCT Pub. No. WO83/03890, PCT Pub. Date Nov. 10, 1983

PCT Filed Apr. 27, 1983, Ser. No. 571,553

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1982, 3215779

Int. Cl.⁴ F22B *33/00*

U.S. Cl. 122—20 B **25 Claims**



1. A gas water heater comprising:

a gas burner for producing waste gases;

duct means for receiving the burner's waste gases, said duct means including a first chamber means located next to said burner for guiding the waste gases generally in a first direction, a second chamber means for guiding the waste gases in a second direction generally opposite to said first direction and a partition wall adjacent both said first and second chamber means,

heat exchanger means for subjecting heating water passing therethrough to heat transfer from the waste gases within said first and second chamber means, said heat exchanger means crossing said partition wall and having first and second heat exchanging segments on opposite sides of said partition wall, said first segment being located in said second chamber means and said second segment being located in said first chamber means, both said heat exchanging segments being flowed through by said heating water transversely to the waste gas flowing directions in said first and second chamber means of said duct means; and

said partition wall defining, spaced from said heat exchanger means, a waste gas diversion opening for passing the waste gas current from said first chamber means into said second chamber means.

4,557,221

FUEL ADDITIVE INJECTION SYSTEM

Mostafa M. Kamel; Larry D. Wells, and Jerry C. Buchanan, all of Columbus, Ind., assignors to Cummins Engine Company, Inc., Columbus, Ind.

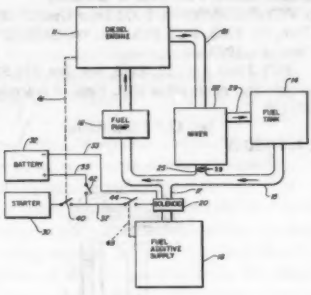
Filed May 27, 1983, Ser. No. 498,717

Int. Cl.⁴ F02B *51/00*

U.S. Cl. 123—1 A **8 Claims**

1. The combination of a diesel engine, a fuel tank, a fuel supply line in communication with said engine for supplying fuel from said fuel tank to said engine through a fuel pump, a fuel additive tank containing an ignition improving additive, a fuel additive supply line communicating with said fuel additive tank and said fuel supply line, valve means in said fuel additive supply line for controllably supplying an ignition improving additive from the said fuel additive tank to said fuel supply line, a receptacle for receiving return fuel from said diesel engine having a first discharge outlet connecting with said fuel supply

line and a second discharge outlet connecting with said fuel tank and temperature responsive valve means which below a predetermined temperature directs flow from the first dis-



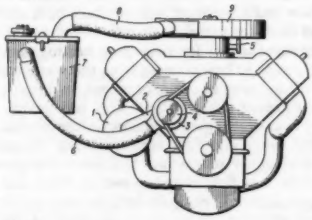
charge outlet of said receptacle to said fuel supply line and which above a predetermined temperature directs fuel to said fuel tank whereby build-up of the ignition improving additive in said fuel tank is minimized.

4,557,222

FORCED HUMID ASPIRATION FOR INTERNAL COMBUSTION ENGINES

Herbert A. Nelson, Star Rte., Nathrop, Colo. 81236

Filed Sep. 2, 1983, Ser. No. 528,968
Int. Cl.[4] F02M *25/04*
U.S. Cl. 123—25 B **4 Claims**



1. An apparatus for improving the fuel efficiency of an internal combustion engine by increasing the density of humid air supplied to the intake of said engine to insure sufficient oxygen for complete fuel utilization, the apparatus comprising:

a heater cowl enclosing a specified space around an exhaust manifold of said engine, said space being an air passage into an outlet from said heater cowl in communication with the inlet of;

a centrifugal air pump which is driven by a v-belt from said engine crankshaft rotation, said pump discharge chamber in communication with the inlet of:

a humidifier consisting of a body and cover in which lower portion, a water storage for saturating wicks which are attached to a frame suspending said wicks vertically in rows whereby lower portion of said wicks, being submersed, feeding by capillary attraction into upper portion of same extending into an evaporating chamber of upper interior of said body through which an air passage progressing from said humidifier intake, under a dispersing partition into the lanes between said wick rows, into a space above said wicks under said body cover and into an outlet through said cover in communication with the air inlet of said engine, and;

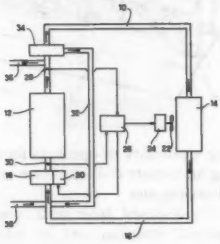
heating, propelling and humidifying a dense air supply for increasing the efficiency of an internal combustion engine.

4,557,223

COOLING DEVICE FOR AN INTERNAL COMBUSTION ENGINE

Huu-Can N Gueyen, Portet-sur-Garonne, France, assignor to Equipements Automobiles Marchal, Issy-Les-Moulineaux, France

PCT No. PCT/FR83/00157, § 371 Date Apr. 5, 1984, § 102(e) Date Apr. 5, 1984, PCT Pub. No. WO84/00578, PCT Pub. Date Feb. 16, 1984
PCT Filed Jul. 26, 1983, Ser. No. 604,646
Claims priority, application France, Aug. 5, 1982, 8213687
Int. Cl.[4] F01P *7/14*
U.S. Cl. 123—41.12 **7 Claims**



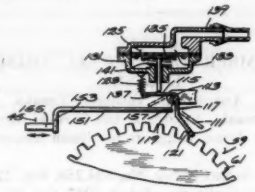
1. A cooling system for an internal combustion engine, in particular for an automobile, said system comprising a closed cooling circuit in which a liquid coolant is circulated by the action of at least one circulating pump driven by a variable speed electric driving motor, a sensor for detecting the temperature T_{MS} of the coolant discharged from a coolant outlet of the engine, the coolant passing, after discharge from the engine, through at least one supply duct into at least one heat exchanger associated with at least one fan driven by a variable speed electric driving motor, said coolant being returned, after discharge from said heat exchanger, through at least one return duct to the circulating pump which supplies the coolant to a coolant inlet of the engine, a bypass duct connected to said return duct upstream of said circulating pump, and to said supply duct at a location of a thermostat valve for preventing coolant from circulating to the heat exchanger while the temperature, T_{MS}, of the coolant discharged from the engine is lower than a first threshold temperature S_V, and for opening when T_{MS} is greater than or equal to S_V so that fluid is circulated through the heat exchanger and for again closing when T_{MS} is lower than or equal to $S_V+\Delta S_V$, wherein ΔS_V is positive, negative or zero, a second sensor for detecting the temperature of the coolant entering the engine, an electronic control unit for controlling the operation and speed of the fan driving motor and the pump driving motor in response to the temperatures sensed by the first and second sensors, such that when the temperature T_{MS} of coolant discharged from the engine reaches a threshold S_F which is lower than S_V, the pump is driven at a first speed V_1 which is automatically controlled to maintain the temperature variation ΔT_M of the coolant between the inlet and the outlet of the engine at a value which is lower than or equal to a limit value ΔS_M, the pump is driven at a constant speed V_1 for as long as the variation ΔT_M is lower than the limit value ΔS_M and, as soon as the variation ΔT_M becomes greater than ΔS_M, at an increased speed V_1 until ΔT_M is limited by ΔS_M, and when T_{MS} reaches threshold S_V, the control unit controls the driving of the pump at a speed automatically controlled by the temperature T_{MS} in order to regulate this temperature T_{MS} to a reference value S_3 which is greater than the first threshold S_V.

4,557,224

MECHANISM FOR PRODUCING AUDIBLE WARNING IN RESPONSE TO COOLANT SYSTEM FAILURE

Chester G. DuBois, Zion, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Dec. 1, 1980, Ser. No. 211,640
Int. Cl.[4] F01P *11/18*
U.S. Cl. 123—41.15 21 Claims



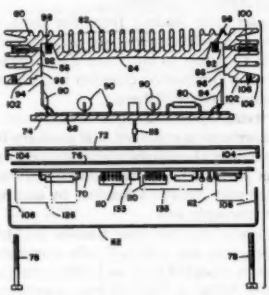
1. An engine including a flywheel, a cooling system, and means including a member selectively engageable with said flywheel in response to malfunctioning of said cooling system for producing an audible noise.

4,557,225

COMBINED HOUSING AND HEAT SINK FOR ELECTRONIC ENGINE CONTROL SYSTEM COMPONENTS

Paul Sagues, Berkeley, and Peter Sagues, El Cerrito, both of Calif., assignors to Mikuni Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 18, 1984, Ser. No. 571,803
Int. Cl.[4] F01P *1/06*
U.S. Cl. 123—41.31 5 Claims



1. An enclosure containing elements of an electronic fuel control system comprising:

a main housing of heat conducting metal having a relatively thick top portion and sidewalls forming a recessed space with elongated grooves adjacent each sidewall on opposite sides of said top portion, each said groove having at least one planar inner surface;

a first printed circuit board with heat producing electronic elements arranged in two rows on opposite sides of said board, said elements in each said row having projecting tab portions that extend into one of said grooves;

strip means in each said groove for retaining said tap portions therein against the planar inner surface of said groove and thereby causing heat conduction from said electronic elements into said main housing member;

a second printed circuit board with logic, memory and processor elements;

insulation means between said first and second boards;

means for electrically interconnecting said boards within said enclosure;

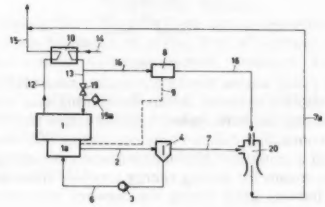
and cover means extending between said sidewalls for holding said boards firmly within said enclosure.

4,557,226

DEVICE FOR RETURNING THE BLOW-BY RATE FROM THE CRANKCASE INTO THE SYSTEM OF A SUPERCHARGED INTERNAL COMBUSTION ENGINE

Andreas Mayer, Niederrohrdorf, Switzerland, and Rudolf Stüssi, Los Angeles, Calif., assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Nov. 13, 1984, Ser. No. 670,575
Int. Cl.[4] F01M *13/00*
U.S. Cl. 123—41.86 12 Claims



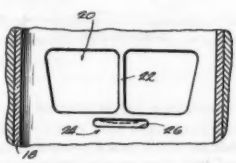
1. Device for returning the blow-by gases from the crankcase into the system of a supercharged internal combustion engine, having a gas delivery unit which is driven by a propellant and which, when a control device placed in the extraction line is connected in, generates a reduced pressure in the crankcase, wherein the internal combustion engine is supercharged by a gas-dynamic pressure-wave supercharger and the propellant for the gas delivery unit is gas which is taken from the output of the gas-dynamic pressure-wave supercharger in a propellant line and which is controllable by means of a controller placed in the propellant line in such a way that, throughout the operating range, a reduced pressure of not greater than −50 mbar prevails in the crankcase.

4,557,227

EXHAUST PORT BRIDGE RELIEF HOLE

Robert W. Woodard, Waukegan, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed May 10, 1984, Ser. No. 608,905
Int. Cl.[4] F02F *1/22*
U.S. Cl. 123—65 PE 11 Claims

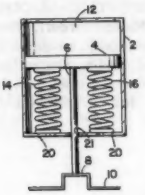


1. An internal combustion engine including a cylinder which has a liner and which is adapted to receive a piston for reciprocal movement within said cylinder liner, said cylinder liner including an exhaust port, an exhaust port bridge extending across said exhaust port, and means for allowing said exhaust port bridge to expand in a direction other than toward the path of piston movement, said means including a relief hole extending only through said cylinder liner near said exhaust port bridge.

4,557,228
PISTON AND SPRING POWERED ENGINE

Arthur J. Samodovitz, 1 Lakeshore Dr., Apt. A-4, Farmington, Conn. 06032

Continuation-in-part of Ser. No. 335,864, Dec. 30, 1981, abandoned. This application Sep. 20, 1983, Ser. No. 533,935
Int. Cl.[4] F02B *75/00*
U.S. Cl. 123—78 E 14 Claims



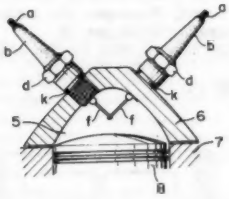
1. In a piston engine having a cylinder, means for introducing fuel into the cylinder, means for igniting said fuel, means for exhausting the burnt gases, a piston within the cylinder, a crank, a connecting rod pivotally connecting the piston to the crank, and a crankshaft, the improvement comprising:

resilient means for storing energy received from the pistion and burning gases during the outward movement of the pistion, and for delivering most of said stored energy to the crankshaft during the inward movement of the piston in a manner which drives the crankshaft in its existing direction of rotation, said resilient means comprising a spring connecting between the piston and a point stationary relative to the cylinder.

4,557,229
IGNITION APPARATUS FOR INTERNAL COMBUSTION ENGINES

Osamu Kashima, Kariya, and Masamichi Shibata, Anjo, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jun. 6, 1983, Ser. No. 501,765
Claims priority, application Japan, Jun. 7, 1982, 57-98366; Jun. 7, 1982, 57-98367; Jun. 28, 1982, 57-110952
Int. Cl.[4] F02P *1/00*
U.S. Cl. 123—169 EL 5 Claims



1. An ignition apparatus for an internal combustion engine comprising:

a first electrode assembly and a second electrode assembly each thereof including an electrode and mounted on a cylinder head of said internal combustion engine;

at least one ignition coil having a primary winding and a secondary winding;

the electrodes of said first and second electrode assemblies being electrically connected to respective ends of the secondary winding of said ignition coil;

each of the electrodes of said first and second electrode assemblies being supported on the cylinder head of said engine electrically insulated therefrom;

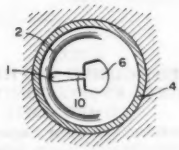
a spark gap formed between the electrodes of said first and second electrode assemblies to cause spark discharge between the electrodes, the electrodes being arranged so that end portions of the respective electrodes cross each other with side surfaces of the end portions being opposite to each other to provide said spark gap therebetween; and

a high tension circuit including the secondary winding of said ignition coil connected respectively to the electrodes of said first and second electrode assemblies being electrically insulated from said engine.

4,557,230
SWIRL CHAMBER FOR INTERNAL COMBUSTION ENGINE

Yukihiro Etoh, Yokohama; Toshiaki Tanaka, Chigasaki; Nobukazu Kanesaki, Yokosuka, and Hiroaki Miyazaki, Kamakura, all of Japan, assignors to Nissan Motor Co., Ltd., Japan

Continuation-in-part of Ser. No. 534,258, Sep. 21, 1983, abandoned. This application Jan. 8, 1985, Ser. No. 689,816
Claims priority, application Japan, Oct. 28, 1982, 57-163736[U]
Int. Cl.[4] F02B *19/08*
U.S. Cl. 123—263 7 Claims



1. In an internal combustion engine having a swirl chamber into which fuel is injected by a fuel injector and a main combustion chamber, a port arrangement for providing fluid communication therebetween comprising:

a main transfer port leading from the main combustion chamber to said swirl chamber and opening into said swirl chamber in a manner to introduce a fluid charge moving from said main combustion chamber into said swirl chamber in a manner to swirl therein;

an auxiliary transfer port leading from said swirl chamber to said main combustion chamber, said auxiliary transfer port having a cross-sectional area which is smaller than that of the transfer port and being located so that a fraction of the fuel injected into said swirl chamber by said fuel injector, passes therethrough; and

a slot which leads from said main transfer port to said auxiliary transfer port and which fluidly communicates said auxiliary swirl chamber with said main combustion chamber said slot being at least in part narrower than said auxiliary transfer port and arranged so as to not reduce the swirl generated by the flow of fluid through said main transfer port.

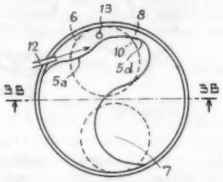
4,557,231
COMBUSTION CHAMBER OF A RECIPROCATING INTERNAL COMBUSTION ENGINE WHICH PROMOTES A ROTARY COMBUSTION TURBULENCE

Georges E. Thery, 6,place du Général Leclerc, Pierrefitte, France 93380

Filed Jul. 28, 1982, Ser. No. 402,555
Int. Cl.[4] F02B *23/00*
U.S. Cl. 123—279 6 Claims

1. Reciprocating combustion engine comprising at least one piston, one cylinder and a cylinder head delimiting a combustion chamber, the head of said piston comprising a projecting part, said engine further comprising an exhaust valve and injector means for admitting a fuel mixture to said combustion chamber, and wherein said engine operates so that at least the

end of the admission of the fuel mixture is concurrent with the onset of the combustion, characterized in that said projecting part and the cylinder head are shaped in such a manner that two first portions of the piston surface are spaced from the internal surface of the cylinder head and are separated from one another by said projecting part, and that a third portion of the piston surface has a first part which is next to the internal surface of the cylinder head when the piston is at the upper dead center point, said third portion of the surface comprising a second part which is at a distance from the internal surface of the cylinder head to form a connecting zone for said two first portions, these latter determining together with the cylinder head, respectively, an initial combustion zone and an expansion zone for the gases originating from the combustion, while said



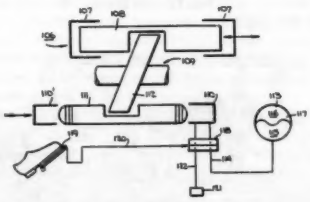
connecting zone together with the cylinder head forms an orifice having a longitudinal direction for passage of said gases from the initial combustion zone to the expansion zone along said longitudinal direction of said orifice and for guiding said gases along the cylinder head, wherein said expansion zone has a wall formed to have, in a plane extending along the longitudinal direction of said orifice, an outline which is curved in the direction toward said orifice, said wall is located in the path of gases flowing out of said orifice, and said wall and said orifice constitute means for imparting a rotary turbulence to gases in the expansion zone, and further characterized in that the part of the initial combustion zone which is next to said connecting zone is located in proximity to the exhaust valve and that said injector means is oriented to direct the fuel mixture in the direction of the exhaust valve.

4,557,232

SWASH PLATE ENGINE

John Z. DeLorean, 834 Fifth Ave., New York, N.Y. 10021

Division of Ser. No. 383,989, Jun. 1, 1982, Pat. No. 4,515,113.
This application Jan. 23, 1985, Ser. No. 694,156
Int. Cl.⁴ F02C *7/26*
U.S. Cl. 123—320 **3 Claims**



1. In combination with an engine having at least one pair of combustion chambers, a reciprocable piston slidably disposed between and in said chambers, and means for reciprocating said piston;

said second pair of cylinder chambers, a second reciprocable piston slidably disposed between and in said cylinder chambers and connected to said means for reciprocation thereby;

an accumulator having a first chamber for storing a pressure fluid therein, a second chamber for storing a compressible gas therein and a flexible diaphragm separating said first chamber from said second chamber;

a conduit connected to said first accumulator chamber with one of said cylinder chambers;

a control valve in said conduit for controlling a flow of pressure fluid between said accumulator and said one cylinder chamber; said control valve being operable between a pumping mode in which pressure fluid is pumped from said one cylinder chamber into said first accumulator chamber to brake said engine and a motor mode in which pressure fluid is delivered from said first accumulator chamber to said one cylinder chamber to accelerate said engine; and

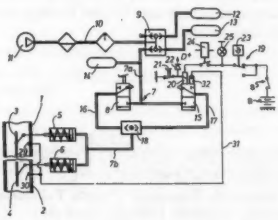
means for switching said control valve between said positions.

4,557,233

CONTROL ARRANGEMENT FOR AN ENGINE EXHAUST BRAKE

Peter Joppig, Korb; Bernard Peitz, Baltmannsweiler, and Dieter Woschee, Esslingen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Oct. 29, 1984, Ser. No. 666,053
Claims priority, application Fed. Rep. of Germany, Oct. 28, 1983, 3339053
Int. Cl.⁴ F02D *9/06*
U.S. Cl. 123—323 **18 Claims**



1. Control arrangement for an exhaust brake of an internal combustion engine, comprising:

an exhaust valve located in an engine exhaust duct;

air-pressure actuated control means for operably moving the exhaust valve to open and closed positions;

first means for selectively connecting said air pressure actuated control means to a source of pressurized air, said first connecting means including a manually operated control element;

second means for selectively connecting said air pressure actuated control means to a source of pressurized air, said connecting means including an electrically operated control element; and

circuit means for controlling the operation of said electrically operated control element in response to engine operating conditions.

4,557,234

METHOD AND SYSTEM FOR CONTROLLING IDLE SPEED IN AN INTERNAL COMBUSTION ENGINE

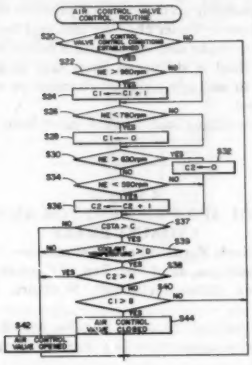
Toshimitsu Ito, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed May 4, 1984, Ser. No. 607,306
Claims priority, application Japan, May 10, 1983, 58-81189; May 10, 1983, 58-81190
Int. Cl.⁴ F02D *5/00, 9/02;* **F02M** *3/00*
U.S. Cl. 123—339 **23 Claims**

1. A method for controlling an idling rotational speed of an internal combustion engine provided with an air intake passage, a throttle valve therein and a bypass passage located upstream of the throttle valve to that located downstream thereof, wherein said idling rotational speed of the engine is

controlled to be within a predetermined range, comprising the steps of:

sensing actual rotational speed of said engine;



counting for a time period beginning when engine rotational speed is increased to an upper limit value of said predetermined range to thereby establish a control parameter; and

blocking completely said bypass passage in accordance with said time period.

4,557,235

FUEL INJECTION QUANTITY CONTROLLING DEVICE FOR DIESEL ENGINE WITH VERTICAL CRANKSHAFT

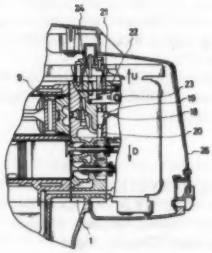
Koichi Amemori, Takatsuki; Yosuke Takahashi, Kobe; Manabu Miyazaki, Ibaraki; Hiroaki Tsukahara, Osaka; Toshihiko Kawabe, Takatsuki, and Toshio Banba, Osaka, all of Japan, assignors to Yanmar Diesel Engine Co., Ltd., Osaka, Japan

Filed Dec. 2, 1983, Ser. No. 557,673

Claims priority, application Japan, May 16, 1983, 58-71675[U]; May 16, 1983, 58-71676[U]; May 16, 1983, 58-71677[U]; May 31, 1983, 58-81103[U]; Jun. 20, 1983, 58-109297; Jun. 20, 1983, 58-109298; Jun. 21, 1983, 58-110189

Int. Cl.[4] **F02M** *59/20*

U.S. Cl. 123—367 **10 Claims**



1. In a diesel engine provided with a fuel injection device and provided with a vertically extending crankshaft, a fuel injection quantity controlling device comprising: a control rod for controlling quantity of fuel injection from said fuel injection device and disposed to extend in a vertical direction and parallel with said crankshaft, said control rod being so arranged as to cut a fuel supply to said fuel injection device when it is moved by its weight in a direction of force of gravity.

4,557,236

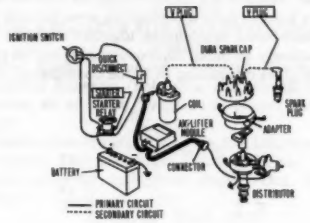
COMBUSTION ROUGHNESS SERVO CONTROL TO CONTROL FUEL/AIR METERING OR EGR METERING TO AN INTERNAL COMBUSTION ENGINE

Merle R. Showalter, Madison, Wis., assignor to Automotive Engine Associates, Madison, Wis.

Filed Dec. 29, 1983, Ser. No. 566,902

Int. Cl.[4] **F02M** *7/00;* **G01M** *15/00*

U.S. Cl. 123—435 **4 Claims**



1. Control apparatus for obtaining a measure of flame speed in the combustion chamber of an internal combustion engine and based on said measure adjusting air/fuel ratio apparatus so that the variation of flame speed falls within a specified degree of statistical variation, said apparatus comprising means for obtaining a measure of flame speed on each burn cycle of the engine and producing an electric signal having a peak representative thereof, means for storing in succession the signal peaks of said electric signals, means for converting the signal peaks to a plurality of numbers corresponding respectively to said signal peaks, computer means for averaging said numbers for a given quantity of successive cycles and comparing said average with the last received signal peak number and means for comparing the number average and that of the last received signal peak to produce a difference and acting on the air/fuel ratio apparatus to enlean the mixture if the difference is within designated limits and acting to enrich the mixture if the difference is outside the designated limits whereby the air/fuel mixture is adjusted so that the flame speeds of the burn cycles will fall within a specified degree of statistical variation.

4,557,237

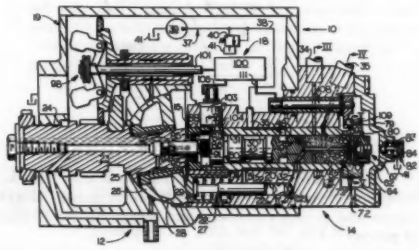
BYPASS RESTRICTOR FOR DISTRIBUTION VALVE

Fred R. Bally, East Peoria, and Donald J. Waldman, Brimfield, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 27, 1984, Ser. No. 593,989

Int. Cl.[4] **F02M** *41/06*

U.S. Cl. 123—450 **9 Claims**



1. In a distribution valve **(14)** having a housing **(19)** defining a bore **(31)** and a plurality of distributor passages **(34/36)** in communication with the bore **(31)**; a rotor **(42)** located in the bore **(31)** and adapted to rotate, said rotor **(31)** having a peripheral surface **(52)**, an axial passage **(43)** located therein adapted for selective communication with a source **(12)** of pressurized

fluid, an outlet port (45/46) communicating with the axial passage (43) and adapted for selective communication with each of the plurality of distributor passages (34/35), and bypass port means (62) communicating with the axial passage (43) and exiting on the peripheral surface (52) of the rotor (42); a bypass collar (72) disposed about a portion of the rotor (42) and having spill passage means (75) for selectively communicating the bypass port means (62) of said rotor (42) with a low pressure chamber (64), said bypass collar (72) being adjustably restrained from rotation relative to said rotor (42), the improvement comprising:

means (67) for continuously restricting at all times during fluid bypass the flow of fluid from the axial passage (43) to the low pressure chamber (64); and

means (82) for controlling the pressure level of pressurized fluid in said low pressure chamber (64) to a predetermined level above atmospheric pressure, said controlling means being located between the low pressure chamber and a fluid reservoir.

4,557,238

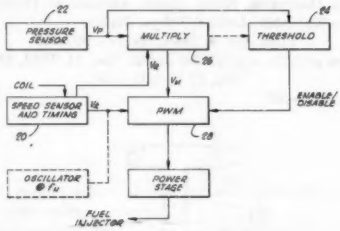
APPARATUS FOR SUPPLYING FUEL TO AN ENGINE

Charles M. Kuehnl, Oklahoma City, Okla., assignor to Miller-Woods Inc., Wrentham, Mass.

Filed Aug. 9, 1982, Ser. No. 406,278

Int. Cl.⁴ F02M *51/02*

U.S. Cl. 123—492 **28 Claims**



1. An apparatus for supplying fuel to an engine having a fuel system which includes a primary fuel supply system and an auxiliary fuel injector associated therewith, said apparatus comprising:

speed sensing means for sensing the speed of the engine;

pressure sensing means for sensing a pressure in the engine;

multiplier means for multiplying the sensed speed by the sensed pressure;

modulation means, responsive to said multiplier means, for generating a control signal for controlling the auxiliary fuel injector to supply additional fuel to the engine in supplementation of the fuel provided by the primary fuel supply system, said control signal being proportional to the mutliplied sensed speed and pressure; and

threshold means for disabling said modulation means when a condition proportional to the sensed pressure is below a predetermined value, said predetermined value being selected to indicate a supercharged condition.

4,557,239

CENTRIFUGAL INJECTION TIMING CONTROL DEVICE FOR FUEL INJECTION PUMPS

Hideo Ohkubo, Higashimatsuyama, Japan, assignor to Diesel Kiki Co., Ltd., Higashimatsuyama, Japan

Filed Sep. 6, 1984, Ser. No. 647,978

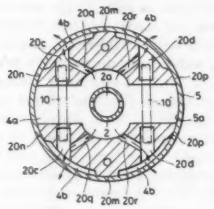
Claims priority, application Japan, Sep. 14, 1983, 58-142556[U]

Int. Cl.⁴ F02M *59/20*

U.S. Cl. 123—501 **3 Claims**

1. In a centrifugal injection timing control device for a fuel injection pump, including a driving rotary member, a driven rotary member, a housing arranged concentrically with said driven rotary member and rotatable in unison therewith, centrifugal weight means accommodated within said housing and displaceable diametrically thereof in response to rotation of said driven rotary member, said centrifugal weight means defining a radially inner chamber in cooperation with said driven rotary member and at least one radially outer chamber in cooperation with said housing, and double eccentric cam means interposed between said driving rotary member and said centrifugal weight means and engaging with said driving rotary member and said centrifugal weight means, wherein diametrical displacement of said centrifugal weight means causes corresponding circumferential displacement of said driven rotary member relative to said driving rotary member through said double eccentric cam means;

the improvement comprising:



passage means formed in said centrifugal weight means and communicating said radially inner chamber with said radially outer chamber;

said centrifugal weight means includes a pair of centrifugal weight members arranged diametrically oppositely with respect to said driven rotary member, said centrifugal weight member each having a radially inner face disposed opposite said driven rotary member and defining said radially inner chamber, and a radially outer face disposed opposite said housing and defining said radially outer chamber; and

said passage means including a first groove formed in said radially inner face of each of said centrifugal weight members, and a second groove formed in said radially outer face of each of said centrifugal weight members and continuous with said first groove.

4,557,240

INJECTION TIMING CONTROL DEVICE FOR DISTRIBUTOR-TYPE FUEL INJECTION PUMPS

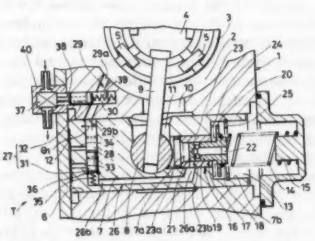
Toru Sakuranaka, Higashimatsuyama, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed May 2, 1985, Ser. No. 729,694

Claims priority, application Japan, May 9, 1984, 59-92459

Int. Cl.⁴ F02M *59/20*

U.S. Cl. 123—502 **7 Claims**



1. An injection timing control device for combination with a

fuel injection pump for an internal combustion engine, said pump being of the type having a suction space filled with fuel under pressure variable as a function of the rotational speed of said engine, a pumping and distributing plunger, and a roller holder carrying a plurality of rollers circumferentially arranged and disposed in camming engagement with said plunger, said injection timing control device comprising: a cylinder; a timer piston slidably received within said cylinder, said timer piston being coupled to said roller holder in a manner such that displacement thereof causes a corresponding change in the circumferential position of said roller holder; a first chamber defined at one end of said timer piston; a second chamber defined at another opposite end of said timer piston, said second chamber communicating with a zone under lower pressure; a timer spring accommodated within said second chamber; first and second communication passageways extending between said suction space of said pump and said first chamber, said first and second communication passageways being located at least in part within said timer piston; servo valve means arranged across said first communication passageway at a location within said timer piston, said servo valve means having a valve body displaceable relative to said timer piston against the force of said timer spring in response to a change in fuel pressure within said suction space, to selectively assume a first position where it disconnects a portion of said first communication passageway closer to said first chamber with respect to said valve body from said suction space and simultaneously communicates same with said second chamber, a second position where it communicates said first communication passageway portion with said suction space and simultaneously disconnects same from said second chamber, and a third position where it disconnects said first communication passageway portion from both of said suction space and said second chamber; means for keeping said second communication passageway opened while said timer piston is displaced from an initial starting position thereof at least to a position corresponding to a predetermined advance in the injection timing, at the start of said engine; selector means responsive to a temperature of said engine to close said first communication passageway portion and simultaneously open said second communication passageway when the temperature of said engine is lower than a predetermined value, and to open said first communication passageway portion and simultaneously close said second communication passageway when the temperature of said engine is higher than said predetermined value.

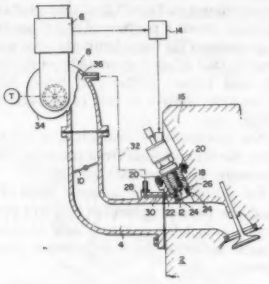
4,557,241

FUEL INJECTION MEANS HAVING AIR BLEED MEANS

Masayuki Kawachi, and Yasushi Kono, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Feb. 2, 1982, Ser. No. 344,971
Claims priority, application Japan, Feb. 4, 1981, 56-15213
Int. Cl.[4] F02B *23/00*
U.S. Cl. 123—585 **12 Claims**

1. An intake system for internal combustion engines comprising: intake passage means provided with throttle valve means, supercharging means provided in said intake passage means upstream of the throttle valve means for compressing engine intake air to thereby supply the air under pressure to engine combustion chamber means through said throttle valve means, fuel injection means provided in said intake passage means downstream of the throttle valve means for injecting a metered amount of fuel to said intake passage means, airflow detecting means provided in said intake passage means for detecting engine intake air flow, control means responsive to an output of the airflow detecting means for controlling the amount of fuel injection from the fuel injection means in accordance with the output of the airflow detecting means, air bleed means for discharging bleed air to the fuel injected from the fuel injection means, said air bleed means including bleed air passage means separate from said intake passage means and having an upstream end opened to the intake passage means between said supercharging means and said throttle valve means and having a downstream end external and adjacent to said fuel injection means so as to discharge the bleed air directly to the fuel after it is injected into the intake passage means from the fuel injection means.

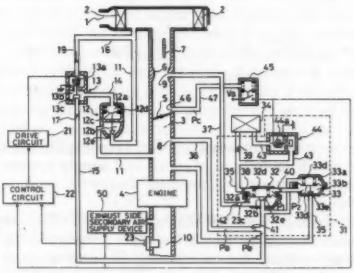


4,557,242

AIR/FUEL RATIO FEEDBACK CONTROL SYSTEM FOR AN INTERNAL COMBUSTION ENGINE OF A VEHICLE

Shumpei Hasegawa, Niiza, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 9, 1984, Ser. No. 597,865
Claims priority, application Japan, Apr. 11, 1983, 58-63925
Int. Cl.[4] F02B *3/00*
U.S. Cl. 123—589 **4 Claims**



1. An air/fuel ratio feedback control system for an internal combustion engine of a vehicle, comprising:

an oxygen sensor disposed in an exhaust passage of the engine;

an air/fuel ratio detection means for detecting an air/fuel ratio on the basis of an output signal of the oxygen sensor and generating an air/fuel ratio detection signal;

an auxiliary passage for supplying a fluid of either intake air or fuel to the engine;

a control valve disposed in said auxiliary passage for varying the amount of the fluid flowing therethrough, said control valve having a pressure chamber for receiving a control fluid and a valve element for varying the sectional area of said auxiliary passage in accordance with pressure level of the control fluid;

means for generating a first control pressure for opening said control valve;

means for generating a second control pressure for closing said control valve;

communicating means responsive to said air/fuel ratio detection signal for switching the application of said first and second control pressure into said pressure into said pres-

sure chamber in accordance with said air/fuel ratio detection signal;

an operational state detection means for detecting an operational state of either the engine or the vehicle in which a feedback control of air/fuel ratio is to be stopped and producing a detection signal upon detection of said operational state; and

an opening degree controlling means responsive to said detection signal, for controlling an opening degree of the control valve at an intermediate level upon presence of said detection signal by supplying a pressure having a pressure level intermediate of pressure levels of said first and second control pressures into said pressure chamber of control valve.

4,557,243

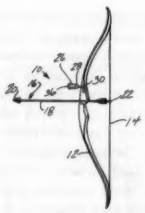
ARROW GAME TRACKER

Robert E. Eastman, II, 1232 Briarcliffe, Flint, Mich. 48504, and Dale W. Gray, 3171 W. Reid Rd., Swartz Creek, Mich. 48473

Filed Jun. 4, 1979, Ser. No. 44,936

Int. Cl.⁴ F41B 5/00

U.S. Cl. 124—88 **3 Claims**



1. A game tracking device for use in combination with a bow, comprising:

a tracking line, the tracking line being center wound into a spool such that the tracking line pays out from the center of the spool,

a container for housing and paying out the tracking line, the container comprising a first end and a second open end for removably and replaceably receiving the spool of tracking line, the container further including a cover removably mounted onto and adapted to fit securely over the second end of the container, the cover being provided with an aperture through which the tracking line is paid out;

a mounting bracket connected to a first end of the container and adapted to mount the container to a bow at a point laterally removed from the bow, and

wherein the tracking line is adapted to be coupled at a first end thereof to an arrow such that when an arrow is launched from a bow and tracking line is drawn from the container to track the position of an arrow.

4,557,244

METHOD OF MACHINE CUTTING SILICON METAL PARTICULATES WITH Si_3N_4

Richard L. Allor, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

PCT No. PCT/US84/00583, § 371 Date Apr. 13, 1984, § 102(e) Date Apr. 13, 1984

PCT Filed Apr. 13, 1984, Ser. No. 612,106

Int. Cl.⁴ B28D 1/00

U.S. Cl. 125—1 **15 Claims**

1. A process of machine cutting a semidense polycrystalline silicon comprising particulate body by relatively moving a substantially fully dense silicon nitride cutting tool against said semidense silicon comprising particulate body to shear off portions of said body along a predetermined path.

4,557,245

CONCRETE CUTTING OR MILLING APPARATUS INCLUDING A GUIDE RAIL

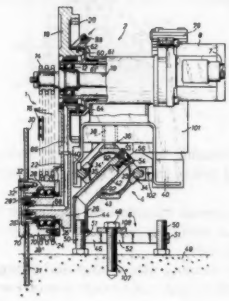
Hans Bieri, Pfaeffikon, Switzerland, assignor to Hydrostress AG, Pfaeffikon, Switzerland

Filed Jan. 11, 1984, Ser. No. 570,006

Claims priority, application Switzerland, Jan. 21, 1983, 351/83

Int. Cl.⁴ B28D 1/04

U.S. Cl. 125—14 **15 Claims**



1. A concrete cutting apparatus, comprising guide rail means, a milling head for carrying a motor driven circular saw blade, securing means for movably and releasably securing said milling head to said guide rail means, said guide rail means comprising a plurality of guide rail sections each having means for operatively joining adjacent guide rail sections to each other, each guide rail section comprising at least one support foot structure and connecting means for operatively connecting the support foot structure to the respective guide rail section, said support foot structure further comprising adjustment means for adjusting and correcting the position of said guide rail sections relative to each other and relative to a concrete member to be cut, wherein said milling head comprises housing means, shaft means, bearing means rotatably mounting said shaft means in said housing means, saw blade carrier arm means rotatably mounted to said housing means, saw blade hub means rotatably mounted to a radially outer end of said saw blade carrier arm means, each of said guide rail sections comprising along its length a plurality of cross bores extending through each guide rail section, said connecting means fitting selectively into any one of said cross bores in a releasable manner for locating said support foot structure selectively along the length of the rail section, said cross bores extending at a slanting angle through the respective rail section relative to a vertical or horizontal longitudinal plane through the rail section, and wherein said guide rail sections further comprise an integral single piece hollow steel section having a closed cross-section, two guide means for guiding said milling head, one guide means being located on one side of the closed cross-section, the other guide means being located diametrically opposite said one guide means and an integral tooth rack located between said two guide means, said cross bores forming aligned pairs of bores such that a common axis extending through both bores slants toward said saw blade, whereby a spacing between said saw blade and said support foot structure is minimized.

4,557,246

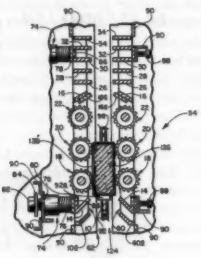
BRICK CLEANING MACHINE

Thomas E. Seeley, 7669 Tingley La., Klamath Falls, Oreg. 97601

Filed Jul. 23, 1984, Ser. No. 633,494

Int. Cl.[4] B28D *1/20*

U.S. Cl. 125—26 **2 Claims**



1. Brick-cleaning apparatus for removing mortar from the sides of used brick, the apparatus comprising,

a frame,

conveyor means mounted on the frame for moving a brick along an elongate path, said path having infeed and off-bearing ends,

and brick-cleaning means disposed along said path engageable with the sides of a brick as such moves along said path and operable to remove mortar lodged on said sides,

said brick-cleaning means including a breaker plate disposed adjacent the feed end of said path inclined at an acute angle relative to the path of an advancing brick which presses and rubs against the sides of a brick to dislodge mortar,

rotatable penetration means located in said path downstream from said breaker plate with penetrating teeth that penetrate and loosen mortar, and

a scraper plate located downstream in said path from said penetration means disposed normal to said path and having a flat terminal surface paralleling and facing a brick moving in said path joining with a scraping edge that scrapes mortar from the brick.

4,557,247

WARM-AIR HEATING APPARATUS

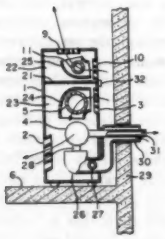
Masanori Hara, Yokohama; Sakuo Sugawara; Kisuke Yamazaki, both of Kamakura, and Hiroshi Kasagi, Chigasaki, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 30, 1983, Ser. No. 556,324

Claims priority, application Japan, Nov. 30, 1982, 57-209709; Nov. 30, 1982, 57-209711; May 30, 1983, 58-95221

Int. Cl.[4] F24F *7/06*

U.S. Cl. 126—99 R **10 Claims**



1. A warm-air heating apparatus comprising:

a casing,

a warm-air blowing port on a front of said casing, said warm-air blowing port and a room-air intake port provided in the casing so as to be in communication with each other,

a heat source placed in said casing between the warm-air blowing port and the room-air intake port,

a blower in said casing for warm air, said blower being positioned to suck air from the room-air intake port and to blow said air into the heat source and through the warm-air blowing port, said blower and warm-air blowing port being arranged to blow warm air toward a lower part of a room within which said apparatus is positioned,

a non-warm air blowing port independent of said warm-air blowing port, and

a second blower for non-warm air, said second blower and non-warm air blowing port being arranged above said first blower and in a common casing with said first blower for feeding a stream of non-warm air above said flow of warm air and toward an upper part of said room from said non-warm air blowing port, and

means for controlling said blower and second blower such that the second blower for non-warm air is actuated at least temporarily during the time of the actuation of the blower for warm air.

9. A warm-air heating apparatus comprising:

a casing,

a warm-air blowing port on a front of said casing, said warm-air blowing port and a room-air intake port provided in the casing so as to be in communication with each other,

a heat source placed in said casing between the warm-air blowing port and the room-air intake port,

a blower in said casing for warm air, said blower being positioned to suck air from the room-air intake port and to blow said air into the heat source and through the warm-air blowing port, said blower and warm-air blowing port being arranged to blow warm air toward a lower part of a room within which said apparatus is positioned,

a non-warm air blowing port independent of said warm-air blowing port; and

a second blower for non-warm air, said second blower and non-warm air blowing port being arranged for feeding a stream of non-warm air above said flow of warm air and toward an upper part of said room from said non-warm air blowing port,

means for controlling said blower and second blower such that the second blower for non-warm air is actuated at least temporarily during the time of the actuation of the blower for warm air;

a room temperature control device to control the operation and stoppage of said blower for warm air including a heat sensitive part of said temperature control device placed near said room-air intake port.

4,557,248

WOOD AND GAS FIRED FURNACE

James A. Richards, 1718 Fairview, Wichita, Kans. 67202

Filed Jan. 7, 1985, Ser. No. 689,439

Int. Cl.[4] F24H *9/18;* **F23K** *3/00*

U.S. Cl. 126—107 **17 Claims**

1. A log burning furnace comprising:

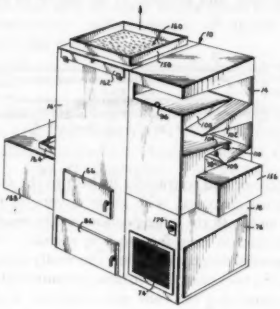
a combustion chamber;

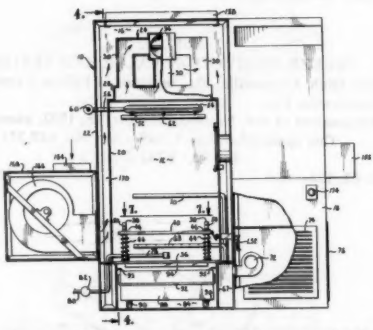
storage means proximal the chamber for storing a supply of wood log fuel for the furnace;

means at least partially in the chamber for sensing the presence of a quantity of log fuel and for generating a signal responsive to said quantity reaching a predetermined minimum amount;

log feeder means operably associated with the chamber and the storage means respectively for conveying logs individually into the chamber, said feeder means being operably coupled with the sensing means for automatically feeding a log into the chamber responsive to the generation of said signal by the sensing means means in the chamber for

supporting said logs, said support means including a grate, means mounting said grate for vertical shifting movement, and spring means operably coupled with the grate biasing the latter toward the upper end of its path of travel, and wherein said sensing means includes an electrical switch operating means mounted for engagement by the grate in disposition to initiate said signal when the weight of logs





on the grate falls below a level sufficient to maintain the grate below a predetermined position proximal the uppermost end of its path of travel,

said switch operating means includes structure for operating the switch to deenergize the feeder means when the grate reaches a position spaced vertically below said predetermined position.

4,557,249

COMPACT HIGH EFFICIENCY FURNACE

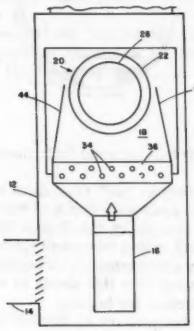
James M. Sweedyk, South Bend, Ind., assignor to Sundstrand Heat Transfer, Inc., Dowagiac, Mich.

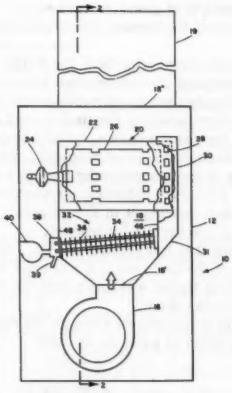
Filed Jan. 25, 1985, Ser. No. 694,879

Int. Cl.[4] F24H *3/08*

U.S. Cl. 126—110 R **7 Claims**

1. A high efficiency furnace having a furnace chamber with walls defining a flow path for air to be heated, an air inlet and an air outlet at opposite ends of said furnace chamber, a combustion chamber mounted in said air flow path and having an exterior surface which reaches elevated temperatures during a combustion process therein which produces high temperature combustion gases, said combustion chamber being located adjacent said air outlet end of said furnace chamber and having an outlet for the combustion gases, a fin and tube heat exchanger mounted substantially transverse to said air flow path, said heat exchanger being located between said combustion chamber and said air inlet and having a combustion gas inlet and a combustion gas exhaust, said heat exchanger having a downward drop between said gas inlet and said gas exhaust and wherein the temperature drop of the combustion gases as they pass from said gas inlet to said gas exhaust is in the temperature range sufficient to provide for condensation of fluids from the combustion gases, said heat exchanger having tubes of a corrosion resistant material through which the combustion gases pass and fins of high thermally conductive material with said fins being in thermally conductive relationship with said tubes, said tube material and said fin material having different temperature coefficients of expansion and wherein the temperature of the combustion gases at said combustion chamber outlet is above a temperatufe sufficient to cause a substantial decrease in the thermal conductive relationship between said fins and said tubes, a combustion gas manifold connecting said combustion chamber outlet and said heat exchanger gas inlet





wherein the temperature of the combustion gases is reduced during travel through said combustion chamber and said manifold, said manifold having the primary function of providing a flow path between said combustion chamber outlet and said heat exchanger gas inlet and only providing a limited amount of heat transfer between the combustion gases and the air to be heated, said combustion gases at said heat exchanger inlet having a temperature below the temperature sufficient to cause a substantial decrease in the thermal conductive relationship between said fins and said tubes, and wherein said furnace chamber is provided with baffles which extend from said heat exchanger and converge inwardly as they approach said combustion chamber so as to direct the air flow passing through

said heat exchanger into thermal transfer relationship with the exterior surfaces of said combustion chamber.

4,557,250

FIREBOX FOR BURNING SOLID FUELS CLEANLY

Arthur R. Kramert, 1410 Del Rio Rd., Roseburg, Oreg. 97470

Filed Dec. 2, 1983, Ser. No. 557,479

Int. Cl.[4] F24B *1/28*

U.S. Cl. 126—125 **2 Claims**

1. A method for burning solid fuels cleanly comprising the steps of:

shaping the firebox to "see" the radiant heat of the fire for focusing and re-radiating that heat back to the fire;

insulating the exterior of the firebox for the purpose of conserving and raising inner wall temperatures;

feeding primary combustion air successively thru an airbox and then flowing it in thin sheets to wipe the hot inner wall of the firebox, for heating;

impinging that hot primary air the full length and on two sides of the fuel charge for optimal contacting;

conducting flames and gases past the face of a reactor bed for burning there;

admitting secondary air through the reactor for heating and the ignition of gases on its face.

2. A method for burning solid fuels cleanly comprising the steps of:

shaping the firebox to "see" the radiant heat of the fire for focusing and re-radiating that heat back to the fire;

channeling hot waste gases down and wrapping the firebox with them whereby the firebox wall remains hot;

turning the gases up again, running inside a jacket or casing and discharging to atmosphere, whereby the jacket or casing is used to surrender heat to a room;

feeding primary combustion air successively thru an airbox and then flowing it in thin sheets to wipe the hot inner wall of the firebox for heating;

impinging that hot primary air the full length and on two sides of the fuel charge for optimal contacting;

conducting flames and gases past the face of a reactor bed for burning there;

admitting secondary air through the reactor for heating and the ignition of gases on its face.

4,557,251

SOLAR WATER BOILING DEVICE

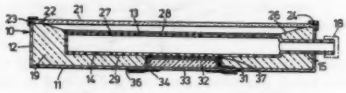
Helmut Burkhardt, 142 Balsam Ave., Toronto, Ontario, Canada 3C1

Filed Feb. 13, 1984, Ser. No. 580,451

Int. Cl.[4] F24J *3/02*

U.S. Cl. 126—417 **9 Claims**

1. A portable solar water boiling assembly comprising two solar water boiling units each comprising: an enclosure with an aperture in its front side; a light transmissive cover extending over the aperture; thermal insulation material on the edges and rear side of the enclosure such that heat loss through the edges and rear side is small as compared with heat loss through the aperture and cover therefor, the insulation material including an edge portion surrounding the periphery of the cover; means forming a water-tight container within the enclosure and comprising a front wall generally parallel to and spaced rearwardly of the cover, a rear wall generally parallel to the front wall and spaced rearwardly therefrom over its entire extent by a distance no more than about 4 cm, means forming an opening in the container for introducing water into and withdrawing water from the container, and a removable closure for sealing the opening; and means providing a light absorptive surface extending generally parallel to the cover and spaced rearwardly therefrom, and adapted to be heated by light passing



through the cover and to transfer its heat to the container; the two units being disposed with their covers in face to face relationship and with the edge portions of the insulation material superimposed in snug face to face register, whereby said insulation material forms a complete thermally-insulative envelope around the two container forming means; and a releasable connector connecting the two units together in said face to face relationship, the connector being releasable to permit the units to be separated one from the other, so that each unit can be used independently of the other.

4,557,252

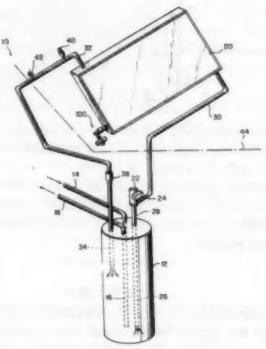
FREEZE PROTECTION VALVE AND SYSTEM

Khánh Dinh, Gainesville, Fla., assignor to Pulstar Corporation, Gainesville, Fla.

Continuation of Ser. No. 485,503, Apr. 15, 1983, abandoned. This application Sep. 7, 1984, Ser. No. 648,351

Int. Cl.[4] F24J *3/02*

U.S. Cl. 126—420 **13 Claims**



1. For use in a solar heating system having a solar collector, a storage tank connected to said solar collector, a pump for circulating liquid from said tank to said solar collector, and means for maintaining liquid in said solar collector at a predetermined pressure, said means including a supply of liquid at a pressure above atmospheric and a temperature above freezing and a connection from said supply of liquid to said solar collector for replacing any liquid lost from said solar collector, a freeze protection device, comprising:

means at least partially disposed within said solar collector for sensing the temperature of liquid in said solar collector, said sensing means including a temperature sensitive fluid which changes state from a liquid to a gas in response to an increase in temperature, said gas creating an increase in pressure in response to an increase in temperature;

means responsive to said temperature sensitive fluid for bleeding liquid from said solar collector to ambient when said sensed temperature falls below a predetermined minimum, said connection being free of valves to inhibit the flow of liquid from said supply to said solar collector when said bleeding means bleeds liquid, whereby cool liquid in said solar collector is automatically replaced by liquid at a temperature above freezing; and

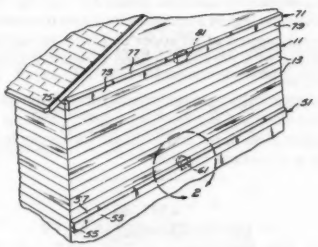
means for compensating for liquid pressure in said bleeding means such that said bleeding means opens to bleed said liquid substantially independently of liquid pressure within said solar collector.

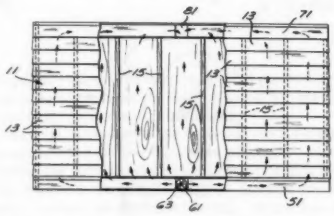
4,557,253

SOLAR COLLECTOR EMPLOYING CONVENTIONAL SIDING, AND AIR DISTRIBUTION SYSTEM THEREFOR

Sherwood G. Talbert; Lawrence J. Flanigan; John M. Corliss, all of Columbus; John G. Hagopian, New Philadelphia, and Thomas P. Nunheimer, Strasburg, all of Ohio, assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Nov. 12, 1982, Ser. No. 440,869
Int. Cl.⁴ F24J *3/02*
U.S. Cl. 126—429 **28 Claims**





1. A system for changing the temperature of air, comprising:

a panel attached to the exterior side of a wall of a building and spaced from said wall to provide an air flow space between said panel and said wall, wherein said panel covers a relatively large portion of said wall, said panel comprising a plurality of substantially horizontal strips of conventional metallic exterior siding, wherein each strip comprises a substantially horizontal bottom portion extending along the length of the strip, said bottom portion having an inner edge and an outer edge, said inner edge being turned upwardly, a substantially planar portion extending upwardly from the outer edge of said bottom portion at an angle of less than 90 degrees with respect to said bottom portion, said planar portion having a substantially flat exterior surface and a substantially flat interior surface, and an upper portion extending upwardly from said planar portion, said upper portion having a downwardly extending lip whereby said lower edge of each strip interlocks with the lip on the upper portion of the next lower adjacent metallic strip;

a first air distribution channel adjacent the lower edge of said panel, extending substantially across the width of said panel, communicating along its length with said space, and adapted to distribute air substantially uniformly across the width of space behind said panel;

an inlet into said first air distribution channel, said inlet communicating with the interior of said building;

a second air distribution channel adjacent the upper edge of said panel, extending substantially across the width of said panel, communicating along its length with said air flow space; and

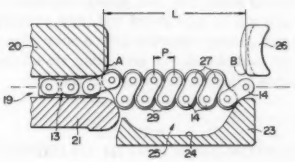
an outlet from said second channel, said outlet communicating with the interior of said building.

4,557,254

ENDOSCOPE

Tathuya Yamaguchi, Hino, Japan, assignor to Olympus Optical Co., Ltd., Japan

Filed Jun. 1, 1984, Ser. No. 616,112
Claims priority, application Japan, Jun. 13, 1983, 58-90229[U]
Int. Cl.⁴ A61B *1/06*
U.S. Cl. 128—4 **8 Claims**



1. An endoscope comprising:

a sprocket disposed within an operating portion of the endoscope and manually operable means for rotating said sprocket,

a roller chain which engages said sprocket, said roller chain including link plates which are pivotally connected to one another by respective rollers;

a pair of operating wires, one end of each of said wires being connected to a respective opposite end of said roller chain, the other end of each of said wires being coupled through the inside of an inserting portion of the endoscope to a bendable portion of the endoscope which is located at one end of said inserting portion;

an inserting passage formed within said operating portion for guiding said roller chain therein; and

a looseness accommodation portion formed in part of said inserting passage with its transverse width being larger than that of the adjacent part of the inserting passage to permit said roller chain to form a bent configuration within said accommodation portion wherein said link plates of the roller chain are alternately bent in opposite directions with the result that the effective longitudinal length of said roller chain is reduced, the size and shape of said accommodation portion being so related to the size and shape of said chain that said chain cannot become stuck in said accommodation portion even when the maximum number of links of said chain are located in said accommodation portion under the condition that they are alternatively bent in opposite directions.

4,557,255

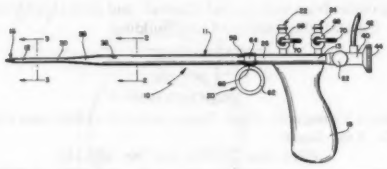
URETEROSCOPE

Tobias M. Goodman, Passpataug Rd., Weekapaug, R.I. 02891

Filed Aug. 22, 1983, Ser. No. 525,620
Int. Cl.⁴ A61B *1/30*
U.S. Cl. 128—7 **16 Claims**

1. A surgical instrument for the human body comprising an elongated, substantially straight, substantially rigid sheath of one piece construction having distal and proximal ends and

having a longitudinal passage therethrough, said sheath comprising an elongated main portion extending from the proximal end of said sheath which is dimensioned for insertion into a patient so that it extends through the urethra into the bladder of said patient, and an elongated reduced terminal portion of rigid construction and substantially uniform sectional dimension at the distal end of said sheath communicating with said main portion and dimensioned to be received through the



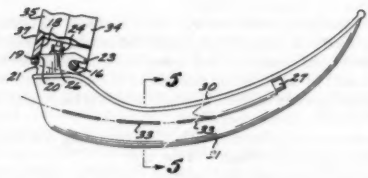
bladder wall and a distance into the ureter of said patient, said sheath having a substantially smooth, continuous circumferential outer surface which extends from a point in said main portion to said distal end, said passage extending through said terminal portion to said distal end, and telescope means received in said passage operable from a point adjacent the proximal end of said sheath for providing visual communication with the area adjacent the distal end thereof.

4,557,256

EXAMINATION DEVICE WITH AN IMPROVED BLADE CONNECTION

Jack Bauman, 1677 San Onofre Drive, Pacific Palisades, Calif. 90272

Filed Jul. 23, 1984, Ser. No. 633,633
Int. Cl.⁴ A61B *1/06*
U.S. Cl. 128—11 **7 Claims**



1. In an examining device comprising a blade, a handle, means to detachably secure the blade to the handle in an L-shaped configuration comprising a boot-shaped depending appendage on the proximal end of the blade, the front end of the boot-shaped appendage adapted to hook under a pivot rod in the front end of an open channel provided in the top of the handle and adapted to receive the boot-shaped appendage on the blade, the improvement comprising means to detachably secure the blade to the handle in at least two positions in the L-shaped configuration, one position being an operating position and one position being a ready position.

4,557,257

PNEUMATIC WALKING BRACE AND OPERATING SYSTEM

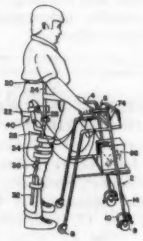
José M. Fernandez, P.O. Box 7383, Pampanos Station, Ponce, P.R. 00732, and Bulcourt Carlos J., 8600 Twin Lake Dr., Boca Raton, Fla. 33434

Filed Jul. 21, 1983, Ser. No. 515,598
Int. Cl.⁴ A61H *3/04*
U.S. Cl. 128—80 G **7 Claims**

1. A walking system for assisting a person to stand in an upright position and for alternately moving the legs to cause a walking movement, comprising:

(a) a wheeled walker of a height permitting its upper part to be grasped by the hands of an erect user of the system,

(b) a normally vertical leg brace extending along the outside of each leg which is pivotally supported at its upper end in relation to the body at the level of the hip joint, and is connected to the leg below the knee joint,



(c) pneumatically operated means for moving the brace of each of the legs in a counter-clockwise direction about the pivotal support at its upper end from its normal vertical position to a position inclined forwardly from that support, and

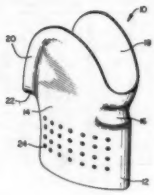
(d) pneumatically operated means for then moving the brace of the same leg in a clockwise direction about the pivotal support at its upper end from the forwardly inclined position to a vertical position.

4,557,258

PROXIMAL TIBIAL CUFF

James M. Ray, and Thomas M. McConnell, both of Orlando, Fla., assignors to Ray-McConnell, Inc., Orlando, Fla.

Filed Oct. 20, 1983, Ser. No. 543,903
Int. Cl.⁴ A61F *13/04*
U.S. Cl. 128—87 R **10 Claims**



1. A proximal tibial cuff, comprising a sleeve including:

a lower portion of interior cross-section substantially conforming to the leg and

an upper portion of interior cross-section substantially conforming to the knee, said upper portion having anterior inward projection means for impressing soft tissue distal to the patella, anterior to the patellar tendon.

4,557,259

SURGICAL METHOD AND APPARATUS FOR INSERTING WIRE INTO THE SPINE

Kent K. Wu, Royal Oak, Mich., assignor to Henry Ford Hospital, Detroit, Mich.

Filed Aug. 10, 1983, Ser. No. 521,683
Int. Cl.⁴ A61F *5/04*
U.S. Cl. 128—92 E **4 Claims**

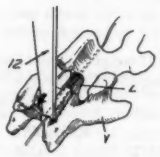
1. In the surgical method wherein wire is utilized in close proximity to the spinal cord, the steps of

inserting a first L-shaped tool having a thin straight tip

between the ligament closest to the spinal cord and the associated vertebra,

manipulating the tool to form a small straight passage,

inserting a second L-shaped tool having a straight tubular tip defining a straight passage extending entirely through the tip into said passage made by the first tool, holding said



tool with the tubular tip in position and threading a wire through the opening of the tubular tip,

holding the wire in said passage, and

removing the tool with the tubular tip while holding the wire in the passage that has been created between the ligament and the vertebra.

4,557,260

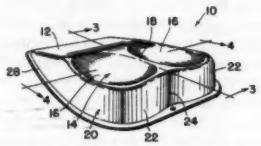
PELVIC SUPPORT FOR MEDICAL PROCEDURES

Pedro M. Reyes, Jr., 1467 Montezuma, West Covina, Calif. 91791

Filed Jul. 22, 1983, Ser. No. 516,380

Int. Cl.[4] A61B *19/00, 17/42*

U.S. Cl. 128—134 **10 Claims**



1. A pelvic support for supporting and positioning the pelvic portion of a patient in an elevated position for examination and other medical procedures, comprising:

a relatively rigid pillow-like body having a forward inclined ramp portion which facilitates placement of the support under the patient while in a prone position and supports the patient's lower back, and an elevated concave generally horizontal platform surface extending rearwardly from the upper rear edge of said ramp portion and configurated and sized for receiving and supporting the patient's buttocks.

4,557,261

CONNECTION SYSTEM FOR FLUID LINES HAVING TELESCOPING CONNECTING ELEMENTS, IN PARTICULAR FOR RESPIRATORS OR ANESTHETIC UNITS

Erich Rügheimer, Maximilianplatz 1, D-8520 Erlangen, Fed. Rep. of Germany

Filed Dec. 8, 1981, Ser. No. 328,694

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1980, 3048223

Int. Cl.[4] A62B *9/04*

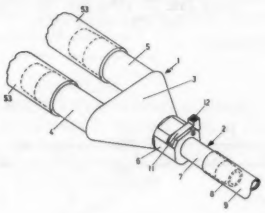
U.S. Cl. 128—202.27 **11 Claims**

1. A connection system for respirator or anesthesia units with a Y-piece including an inhalation hose socket, an exhalation hose socket and a connector attachment piece, as well as a tubular connector having two open ends, one end portion thereof capable of being inserted into the connector attachment piece and having a tube attachment at the opposite end portion adapted to receive an endotracheal tube thereon, and further including said connection system having one connecting element having a first annular groove disposed in its outer circumference, and said connection system having another connecting element including at least one spring-biased fastening means disposed thereon for elastically engaging the annular groove under spring action, the connecting elements being freely rotatable relative to one another, said connection system comprising:

at least one selectively actuable hand-operable unfastening means for temporarily overriding the spring action of said at least one fastening means,

sealing means disposed on said one connecting element and cooperating with the inner circumference of said other connecting element,

said other connecting element constituting the connector attachment piece of said Y-piece and the one connecting element constituting the one end portion of said connector with the tube attachment,



said at least one spring-biased fastening means being provided on said connector attachment piece transversely to its longitudinal axis,

said at least one spring-biased fastening means comprising a lever having inner and outer arms, a pivot and means for spring-loading the outer arm, said connector attachment piece including a slot extending through the sidewall thereof transverse to its longitudinal axis and sized to receive the lever therein, said lever positioned in said slot such that at least a portion of the inner lever arm thereof extends into the lumen of the connector attachment piece and said pivot extending through said slot and said lever parallel to the longitudinal axis of the connector attachment piece whereby one of said arms is movable relative to the other in a plane transverse to the longitudinal axis of said connector attachment piece, said spring loading means including a spring element engaging the connector attachment piece at one end and the outer arm at the other, said spring element biasing the inner arm of said lever into engagement with the annular groove.

4,557,262

DIALYSIS CLAMP

Kenneth T. Snow, P.O. Box 175, Gilberts, Ill. 60136

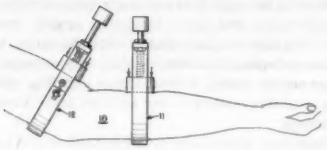
Filed Feb. 15, 1984, Ser. No. 580,335

Int. Cl.[4] A61B *17/12*

U.S. Cl. 128—325 **12 Claims**

1. A clamp for kidney dialysis patients comprising a short cylindrical housing of rigid plastic material, said cylindrical housing having a radial hole in one side thereof, a radially slidable rod passing through said cylindrical housing hole, means guiding said rod for true radial movement into said cylindrical housing through said hole, a pressure pad affixed to the inner end of said rod, spring means mounted around said rod and disposed between the pressure pad and the inner sur-

face of the cylindrical housing, means manually slidably withdrawing said rod with its pressure pad outwardly to compress



the spring and permit the clamp to be slid over a patient's arm to the desired point of pressure.

4,557,263

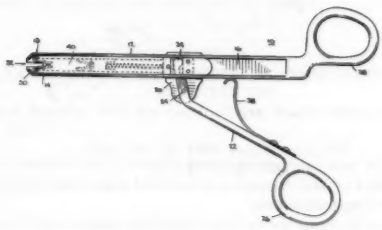
APPARATUS FOR APPLYING SURGICAL CLIPS

David T. Green, Norwalk, Conn., assignor to United States Surgical Corporation, Norwalk, Conn.

Filed Jan. 23, 1984, Ser. No. 573,154

Int. Cl.[4] A61B *17/12*

U.S. Cl. 128—325 **31 Claims**



1. Apparatus for applying a surgical clip to body tissue comprising:

a longitudinal shaft having a distal portion including two laterally spaced, relatively fixed cam surface portions which are inclined toward one another in the distal direction;

clip carrier means for both carrying and closing a surgical clip mounted for longitudinal reciprocal motion relative to the shaft and including a proximal member and two laterally spaced cam follower members pivotally mounted adjacent the distal end of the proximal member, the cam follower members being initially located proximally of the cam surface portions and having surface portions for engaging and supporting a surgical clip in the space between the cam follower members; and

means for causing the clip carrier means to move distally relative to the shaft so that each of the cam follower members engages a respective one of the cam surface portions to force the cam follower members toward one another and close the surgical clip.

4,557,264

SURGICAL FILAMENT FROM POLYPROPYLENE BLENDED WITH POLYETHYLENE

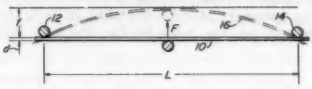
Bernhard Hinsch, Tangstedt, Fed. Rep. of Germany, assignor to Ethicon Inc., Somerville, N.J.

Filed Apr. 9, 1984, Ser. No. 597,857

Int. Cl.[4] A61I *17/00*

U.S. Cl. 128—335.5 **5 Claims**

1. A drawn and oriented, strong and compliant, surgical filament comprising a physical blend of polypropylene and linear low density polyethylene, wherein the filament contains



from about 0.1 to 25 weight percent linear low density polyethylene, based on weight of polyethylene plus polypropylene.

4,557,265

SUTURING INSTRUMENT

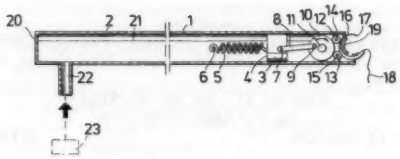
Leif Andersson, Norrahammar, Sweden, assignor to Innova AB, Norrahammar, Sweden

Filed Jan. 26, 1984, Ser. No. 574,215

Claims priority, application Sweden, Feb. 8, 1983, 8300654

Int. Cl.[4] A61B *17/04, 17/06;* D05C *15/04, 15/16*

U.S. Cl. 128—340 **5 Claims**



1. A suturing instrument for joining together two edges of biological tissue, which comprises an instruments housing (**1**), in which there is movably arranged an arcuate suture needle (**16**) having a point (**17**) arranged to penetrate the tissue and a suture thread (**18**) connected to said needle (**16**); and further comprising drive means (**3,8,11,12,13**) for moving the suture needle (**16**) in a manner to pass the suture thread (**18**) down through one of said tissue edges and up through the other of said tissue edges, thereby to join the two tissue edges together with a firm suture, characterized in that the end of the suture needle remote from said point (**17**) is connected to the suture thread (**18**) and arranged to be driven by the drive means in a closed path in the direction of said point (**17**).

4,557,266

PROGRAMMABLE DIGITAL CARDIAC PACER

Robert C. Schober, Huntington Beach, Calif., assignor to American Hospital Supply Corporation, Evanston, Ill.

Division of Ser. No. 103,401, Dec. 13, 1979, Pat. No. 4,388,927. This application Sep. 29, 1982, Ser. No. 427,782

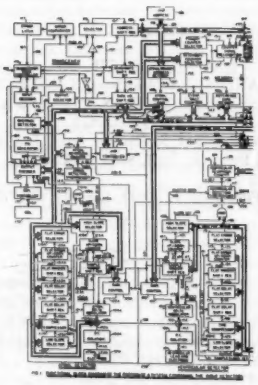
Int. Cl.[4] A61N *1/36*

U.S. Cl. 128—419 PG **48 Claims**

21. Implantable cardiac pacing apparatus comprising: electrode means including at least a first electrode adapted to stimulate the heart; signal detector means including sensing means responsive to a cardiac signal on said electrode means; and digital filter circuit means receiving the signal sensed by said sensing means for quantizing said sensed signal and being programmable for identifying predetermined selection parameters of said signal; memory means for storing signals representative of predetermined selection criteria defined by said selection parameters for said signal including at least a first data word for identifying an R wave and a second data for identifying a T wave; selection circuit means responsive to the quantized output signals of said digital filter means and said stored selection parameter signals for generating a detection signal if said quantized signals of said digital filter means meet said predetermined selection criteria; timing circuit means for establishing timing signal representative of a cardiac cycle in-

cluding a ventricular refractory period and a ventricular rate time out period; and state controller circuit means responsive to said timing signals for coupling said T wave selection criteria data word from said memory means to said digital filter means during said refractory period and for coupling said R wave selection criteria data words from said memory means to said digital filter means during said ventricular rate time out period; and pulse generator means for generating a stimulating pulse on said electrode means if said detector means fails to sense a natural heartbeat before the end of a ventricular rate time out period.

30. Cardiac pacing apparatus comprising: sensing means including an electrode adapted to sense a cardiac signal; detector circuit means receiving said sensed cardiac signal for detecting a predetermined component of said signal and generating a signal defining the commencement of a cardiac cycle; primary timing circuit means responsive to said commencement signal for generating a timing signal representative of the end of a ventricular rate time out period; pulse generator means responsive to said timing signals for generating a stimulating pulse on said electrode means if said detector means has not detected a natural heartbeat with said ventricular rate time



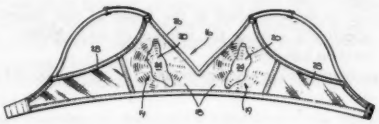
out period; the improvement comprising: first memory circuit means for storing a plurality of first data words, each defining a different duration for said ventricular rate time out period and storing a plurality of second data words, each defining a different time duration for said stimulating signal; circuit means responsive to the application of a predetermined external signal for generating an internal signal in said pacing apparatus representative thereof; status memory means storing a plurality of programmable status signals including a first programmable status signal having an enable and a disable state; and temporary mode counter circuit means responsive to said internal signal and said timing signals for counting a predetermined number of cardiac cycles and including control circuit means responsive to said first status signals' being in an enable state for selecting one of said first data words from said memory means to define a predetermined cardiac rate and one of said second data words to define the width of stimulating pulse, said control circuit means of said temporary mode counter circuit means disabling operation of said apparatus at said programmed rate and pulse width after said counter temporary mode counter circuit means has counted a predetermined number of cardiac cycles.

4,557,267

BRASSIERE AND METHOD OF MAKING SAME

Raymond C. Cole, Hillsdale, N.J., assignor to International Playtex, Inc., Stamford, Conn.

Filed May 20, 1983, Ser. No. 496,771
Int. Cl.[4] A41C *3/06*
U.S. Cl. 128—464 **10 Claims**



1. A breast cup formed of relatively thin fabric, said cup comprising:

covering means secured to said cup for providing supplemental covering confined to essentially only the apex portion of said cup;

and means for rigidifying said covering means,

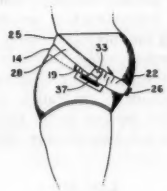
whereby said covering means is adapted to conceal and depress a wearer's nipple to prevent nipple see-through and protrusion through said cup.

4,557,268

UNDER GARMENT PROVIDING SUPPORT

Irene H. Maddux, and Gordon T. Maddux, both of 2118 Linnington Ave., W. Los Angeles, Calif. 90025

Filed Jul. 18, 1984, Ser. No. 631,955
Int. Cl.[4] A41C *1/08*
U.S. Cl. 128—579 R **13 Claims**



1. An undergarment providing support for a user comprising a panty having a body portion;

a first belt affixed permanently to said body portion for completely surrounding the user from above the buttocks to below the abdomen;

means for retaining the belt in position about the body portion of the panty;

adjustable fastening means secured to opposite ends of the belt for adjustably fastening the belt about the body of the wearer; and

a second belt affixed permanently to said body portion above said first belt for providing lower back support for said user.

4,557,269

DISPOSABLE TRANSDUCER APPARATUS FOR AN ELECTROMANOMETRY SYSTEM

Gordon S. Reynolds, Bountiful; Robert J. Todd, Salt Lake City, both of Utah, and Edward J. Russell, San Jose, Calif., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Jun. 22, 1983, Ser. No. 506,753
Int. Cl.[4] A61B *5/02*
U.S. Cl. 128—675 **9 Claims**

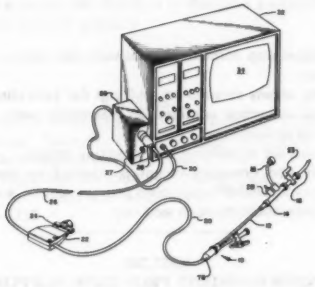
1. In an electromanometry system for monitoring and recording hemodynamic pressures, a disposable transducer apparatus, said electromanometry system including a catheter coupled through tubing to a source of sterile liquid which is used

to fill the tubing and cathether and through which said hemodynamic pressures are mechanically transmitted, said apparatus comprising:

a disposable housing constructed of light weight plastic material, said housing having a transparent chamber with an inlet and outlet, said chamber being connected at said inlet to said tubing;

valve means connected to the outlet of said chamber for selectively venting the interior of said chamber to the ambient atmosphere;

a pressure sensing element mounted at one end of said chamber; said pressure sensing element comprising a thin-diaphragm piezoresistive strain gauge in the form of a resistive bridge network diffused onto a semiconductor substrate;



a nonconductive gel-like substance contained within said chamber, said nonconductive gel-like substance completely covering said pressure sensing element and transmitting said hemodynamic pressures from said sterile liquid to said pressure sensing element; and

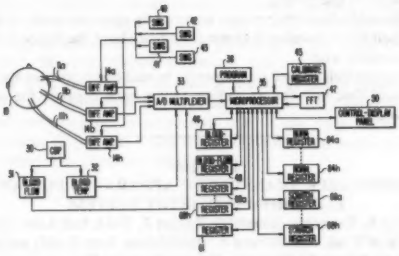
a plurality of disposable calibration resistors electrically connected to said resistive bridge network, said resistors being formed on a semiconductor substrate.

4,557,270

ELECTROENCEPHALOGRAPHIC SYSTEM FOR INTRA-OPERATIVE OPEN-HEART SURGERY

Erwin R. John, Mamaroneck, N.Y., assignor to New York University, New York, N.Y.

Filed Aug. 23, 1983, Ser. No. 525,628
Int. Cl.[4] A61B 5/04
U.S. Cl. 128—731 **2 Claims**



1. An electroencephalograph (EEG) system which is used intra-operatively in open-heart surgery in which the patient's blood is pumped and oxygenated by a cardiovascular bypass, including

perfusion blood flow means and perfusion blood temperature means to respectively measure the patient's blood flow and temperature in the cardiovascular bypass and produce respective corresponding signals;

brain wave signal means comprising a series of electrodes adapted to be connected to the patient's head to produce signals representing the patient's brain waves, amplifiers connected to the electrodes, and analog/digital conversion means connected to the amplifiers to produce sets of digital data corresponding to the patient's brain waves from a plurality of sectors of the patient's head;

data analysis means connected to said blood flow means and said blood temperature means and said brain wave signal means to analyze the digitized brain wave signals based upon the following relationship which predicts the neurophysiological processes attributable to biophysical changes which occur with changes in said flow and temperature:

$$\% \text{ change: } A\left[\frac{T_N - T_P}{10}\right] + B\left[\frac{V_N - V_P}{V_N}\right]$$

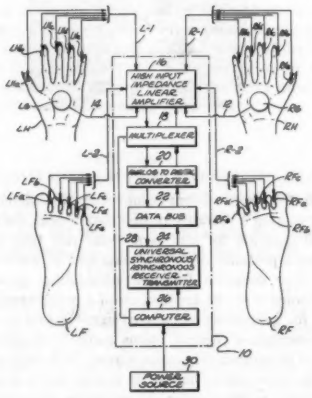
where T_N is the normal body temperature, T_P is the perfusion blood temperature, V_N is the normal perfusion volume, V_P is the current cardiovascular perfusion volume, A is a coefficient in the range of 0.4–0.6 and B is a coefficient in the range of 0.3–0.5.

4,557,271

METHOD AND APPARATUS FOR DETECTING BODY ILLNESS, DYSFUNCTION, DISEASE AND/OR PATHOLOGY

Kenneth P. Stoller, 341 S. Bentley Ave., Los Angeles, Calif. 90049, and Barry E. Taff, 8665 Pickford St., Los Angeles, Calif. 90035

Filed May 11, 1983, Ser. No. 493,707
Int. Cl.[4] A61B 5/05
U.S. Cl. 128—734 **8 Claims**



1. Apparatus for the non-invasive measurement and reporting of D.C. bioelectric potentials associated with organized electrical field patterns about discrete bilateral anatomical sites on the dermal surface of the body of a human subject to determine voltage value symmetry or asymmetry between like bilateral sites as an indication of body organ or biological system normality or abnormality comprising:

(a) a multiplicity of pairs of microgrid D.C. bioelectric potential sensing electrodes each including a multiplicity of separated wires adapted for multi-point bilateral contact with said discrete bilateral anatomical dermal sites for

sensing a multiplicity of D.C. bioelectric potentials at each of said dermal sites;

(b) a pair of single wire ground electrodes adapted for bilateral D.C. bioelectric potential sensing contact with the body of said subject at dermal sites on the right and left body sides remote from the contact sites of said microgrid electrodes;

(c) means for receiving the multi-point D.C. bioelectric potentials sensed by said microgrid electrodes and the D.C. bioelectric potential sensed by said single wire ground electrodes and for converting said D.C. biopotentials to low impedance higher voltage signals, said D.C. bioelectric potential receiving and converting means including a high input impedance linear amplifier having input terminals in electrical communication with the multiplicity of wires of said microgrid electrodes and the single wire ground electrodes;

(d) means for converting said higher voltage signals into a binary code of sensed digital voltage values, said signal converting means including an anolog-to-digital converter having input terminals in electrical communication with said high input impedance linear amplifier;

(e) means for receiving coded binary digital voltage values from said analog-to-digital converter, polling said voltage values and placing said voltage values in ordered format, said voltage value receiving means including a universal synchronous/asynchronous receiver-transmitter having input terminals in electrical communication with said analog-to-digital converter;

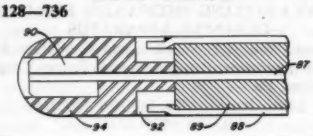
(f) micro-dataprocessor means in electrical communication with said receiver-transmitter for receiving ordered voltage values from said receiver-transmitter, for selecting the highest voltage value sensed by each bilateral microgrid D.C. bioelectric potential sensing electrode in multi-point contact with the dermal surface at a discrete dermal site with respect to the voltage value sensed by the ground electrode on the same body side as each of said microgrid sensing electrodes, for developing a reportable differential, digital D.C. voltage value between said highest voltage value and said ground voltage value for each bilateral anatomical dermal site sensed by said bilateral microgrid sensing electrodes, and for developing a reportable bilateral digital voltage variance value between the differential values of each pair of like anatomical dermal sites; and

(g) means for receiving said differential voltage values for each bilateral dermal site and said voltage variance values for each pair of like dermal sites from said micro-dataprocessor and reporting same in digital form as numerical values of D.C. bioelectric potential and numerical variance values of D.C. bioelectric potential related to normal and abnormal states of the principal body organs or biological systems.

4,557,272
MICROWAVE ENDOSCOPE DETECTION AND TREATMENT SYSTEM

Kenneth L. Carr, Harvard, Mass., assignor to Microwave Associates, Inc., Burlington, Mass.

Continuation-in-part of Ser. No. 135,506, Mar. 31, 1980, Pat. No. 4,436,716. This application Feb. 9, 1981, Ser. No. 232,820
Int. Cl.[4] A61B *5/02*
U.S. Cl. 128—736 **5 Claims**



1. A microwave transducer for applying energy to and receiving energy from living tissue, said transducer comprising:

a microwave transmitter,

a radiating element,

a microwave radiometer means,

a section of transmission line coupled to said radiating element,

said radiating element comprising a dielectric impedance-matching means for substantially matching said radiating element to said tissue but substantially mis-matching said radiating element to air,

said dielectric impedance matching means having a smooth end tip,

means coupling the microwave transmitter to the end of the transmission line remote from said radiating element and for establishing at the radiating element a heating temperature over a predetermined heating period and greater than the normal human body temperature,

means coupling the microwave radiometer means in common with the microwave transmitter to the remote end of the transmission line,

said microwave radiometer means comprising means for sensing temperature at a resolution of fractions of a centigrade degree,

in combination with an endoscopic guide means adapted for passage into an opening in a living body, said guide means including a passage for said transducer and said transmission line, and carrying observation means and light transmission means whereby said transducer may be placed in an observable-operative position within the body,

said means for sensing temperature being operative to register a temperature differential only after a predetermined waiting period following said predetermined heating period so as to increase the temperature differential measurement,

said section of transmission line including an inner conductor and an outer conductor,

said radiating element having a launch means coupled from the transmission line inner conductor and extending beyond said transmission line outer conductor,

said radiating element dielectric impedance-matching means having a smooth tip for holding said launch means.

4,557,273
METHOD AND APPARATUS FOR DETECTING OVULATION

Kenneth P. Stoller, 341 S. Bentley Ave., Los Angeles, Calif. 90049, and Barry E. Taff, 8665 Pickford St., Los Angeles, Calif. 90035

Filed Dec. 27, 1982, Ser. No. 453,744
Int. Cl.[4] A61B *5/04, 5/10*
U.S. Cl. 128—738 **10 Claims**

1. Apparatus for periodically measuring and reporting D.C. bioelectrical potentials of ovulating women subjects in the area of their finger tips during their menstrual cycle to determine a midcycle peak potential value as an indicator of the time of ovulation comprising:

(a) a microgrid finger electrode including a multiplicity of separated wires adapted for multi-point D.C. bioelectrical potential sensing contact with the terminal phalanx portion of a finger on the hand of an ovulating woman subject;

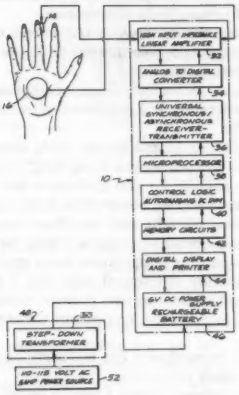
(b) a single wire ground electrode adapted for D.C. bioelectrical potential sensing contact with the body of said subject at a site remote from the contact site of the microgrid finger electrode;

(c) means for receiving the multi-point D.C. bioelectrical potentials sensed by said microgrid electrode and the D.C. bioelectrical potential sensed by said single wire electrode and converting said D.C. potentials to low impedance higher voltage signals, said D.C. bioelectrical potential receiving and converting means including a high input impedance linear amplifier having input terminals in elec-

trical communication with the multiplicity of wires of said microgrid finger electrode and the single wire ground electrode;

(d) means for converting said higher voltage signals into a binary code of sensed digital voltage values, said signal converting means including an analog-to-digital converter having input terminals in electrical communication with said high input impedance linear amplifier;

(e) means for receiving coded binary digital voltage values from said analog-to-digital converter, polling said voltage values and placing said voltage values in ordered format, said voltage value receiving means including a universal synchronous/asynchronous receiver-transmitter having input terminals in electrical communication with said analog-to-digital converter;



(f) micro-dataprocessor means in electrical communication with said receiver-transmitter for receiving ordered digital voltage values from said receiver-transmitter, selecting the highest voltage value sensed by the microgrid finger electrode with respect to the voltage value sensed by the ground electrode, and developing a reportable differential, digital D.C. voltage value between said highest voltage value sensed by said microgrid finger electrode and said ground voltage value; and

(g) means for displaying said differential voltage value in digital form as a numerical value of the D.C. bioelectrical potential of said woman subject at the time of measurement, the highest numerical value of D.C. bioelectrical potential measured over the menstrual cycle comprising a mid-cycle peak potential as indication of the time of ovulation of said subject.

4,557,274

MIDSTREAM URINE COLLECTOR

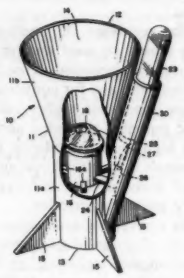
Charles D. Cawood, 11527 N. Lou Al Ct., Houston, Tex. 77024

Continuation-in-part of Ser. No. 385,927, Jun. 7, 1982, abandoned, which is a continuation-in-part of Ser. No. 310,149, Oct. 9, 1981, abandoned. This application Dec. 2, 1983, Ser. No. 557,668

Int. Cl.[4] A47K *11/00*

U.S. Cl. 128—760 **50 Claims**

1. A sterile midstream urine collector comprising a tubular body having an upper inlet, a lower outlet, and a flow passage therebetween; a cup member having an upwardly-directed mouth and being mounted within said passage below said inlet; said cup member being substantially smaller than said passage to permit the downward flow of urine through said passage past said cup member; and urine-deflecting cover means having at least a portion thereof formed of a non-contaminating water-soluble polymeric material capable of disintegrating within 2 to 15 seconds upon direct exposure to a stream of urine; said cover means having a first operative state wherein said portion is intact and said cover means closes the mouth of said cup member and deflects the initial portion of a stream of



urine entering said passage and impinging on said cover, and a second operative state wherein said portion of said cover means is dissolved by exposure to an initial portion of a stream of urine and the mouth of said cup member is exposed to receive an uncontaminated subsequent portion of said stream.

4,557,275

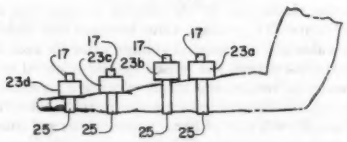
BIOFEEDBACK SYSTEM

Levi T. Dempsey, Jr., 6701 Seat Pleasant Dr., Seat Pleasant, Md. 20743

Filed May 20, 1983, Ser. No. 496,465

Int. Cl.[4] G08B *21/00*; A61B *5/04*

U.S. Cl. 128—782 **14 Claims**



2. A biofeedback system comprising a plurality of force-of-gravity responsive sensing means which are to be removeably fixed to a patient for producing a corresponding plurality of respective signals in response to change in position of portions of the body of the patient with respect to a given plane outside of the body of the patient and signal processing means coupled to said plurality of sensing means and responsive to signals therefrom for developing signals which can be sensed by the patient, and wherein said signal processing means includes circuit means for producing different, sequential, distinctive signals which can be sensed by patient and result from respective sequential positioning of portions of the body of the patient.

4,557,276

FOUR WAY LEVELING MECHANISM FOR COMBINE CLEANING APPARATUS

Myles Hyman; Ronald T. Sheehan, and E. William Rowland-Hill, all of Lancaster, Pa., assignors to Sperry Corporation, New Holland, Pa.

Filed Oct. 11, 1984, Ser. No. 659,934

Int. Cl.[4] A01F *12/32*

U.S. Cl. 130—27 AE **13 Claims**

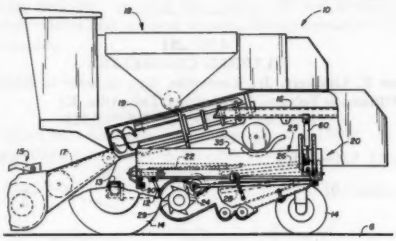
1. A combine harvester comprising:

a mobile main frame adapted for movement across a field;

threshing and separating means mounted on said main frame

to thresh crop material fed thereto and to separate threshed grain from trash material, said threshing and separating means conveying threshed grain along a path of travel;

cleaning means supported by said main frame along said path of travel to receive threshed grain from said threshing and separating means and to clean debris from said threshed grain, said cleaning means being mounted for pivotal movement about a longitudinally extending axis and about a transversely extending axis to permit said cleaning



means to be leveled relative to said main frame, said cleaning means including a subframe, in which is mounted a grain pan and a chaffer sieve, and a shaker shoe pivotally supporting said subframe for movement about said longitudinally extending axis relative to said shaker shoe, said shaker shoe being pivotally mounted on said frame for pivotal movement about said transversely extending axis relative to said main frame; and

actuating means operatively associated with said cleaning means to pivotally move said cleaning means about said longitudinally and transversely extending axes.

4,557,277

MACHINE FOR MANUFACTURING CONTINUOUS CIGARETTE RODS SIMULTANEOUSLY

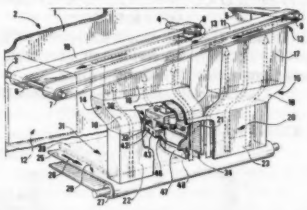
Enzo Seragnoli, Bologna, Italy, assignor to G. D. Societa' per Azioni, Bologna, Italy

Filed Oct. 24, 1983, Ser. No. 544,979

Claims priority, application Italy, Nov. 17, 1982, 3594 A/82

Int. Cl.[4] A24B *5/14*

U.S. Cl. 131—84.3 **9 Claims**



1. A machine for simultaneously manufacturing a number of continuous cigarette rods, comprising a plurality of out-going channels equal in number to said rods, a conveyor for advancing a continuous layer of shredded tobacco of a predetermined thickness in a predetermined direction of feed and at a predetermined speed of advancement towards said channels, and means cooperating with a tobacco layer conveying surface of said conveyor to divide said continuous layer into longitudinal strips equal in number to said channels and each aligned with an inlet of a respective said channel; said channels being arranged side by side and crosswise in relation to said direction of feed, and said dividing means comprising, for each pair of adjacent channels of said out-going channels, at least one pair of nozzles, and means for supplying said nozzles with a fluid under pressure; the nozzles of each said pair being arranged facing said conveying surface, and at a greater distance from said conveying surface than the thickness of said layer; said two nozzles being oriented so as to direct said fluid under pressure to impinge onto said conveying surface in respective directions, which are substantially symmetrical in relation to a plane perpendicular to said conveying surface and parallel to said direction of feed; and said two nozzles being designed so as to eject said fluid under pressure at a speed having a component parallel to, orientated as, and greater than, the speed of advancement of said conveyor.

4,557,278

TOBACCO LAMINA AND STEM PROCESSING

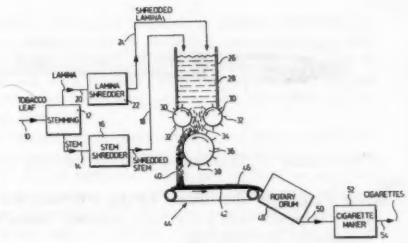
Warren A. Brackmann, and Stanislav M. Snaidr, both of Mississauga, Canada, assignors to Rothmans of Pall Mall Canada Limited, Toronto, Canada

Filed Feb. 23, 1983, Ser. No. 469,098

Claims priority, application United Kingdom, Mar. 2, 1982, 8206084

Int. Cl.[4] A24B *3/08, 3/18*

U.S. Cl. 131—109.1 **10 Claims**



1. A method of mixing shredded tobacco lamina material and shredded tobacco stem material, which comprises:

feeding shredded tobacco lamina material and shredded tobacco stem material from individual sources thereof simultaneously to a first mixing zone to form a coarse intermixture of said shredded tobacco materials,

metering said coarse intermixture from said first mixing zone at a desired flow rate,

mechanically opening said metered intermixture to form individual separated shredded tobacco particles,

passing said separated shredded tobacco particles to a second mixing zone, and

mixing said separated shredded tobacco particles in said second mixing zone to form aggregates of said shredded tobacco lamina material and said shredded tobacco stem material.

9. Apparatus for mixing shredded tobacco lamina material and shredded tobacco stem material, which comprises:

upright reservoir tube means open at the upper and lower ends thereof,

feed means for feeding shredded tobacco lamina material to said reservoir tube means,

feed means for feeding shredded tobacco stem material to said reservoir tube means,

metering means communicating with the lower end of said reservoir tube means to meter coarsely intermixed shredded tobacco material from said reservoir tube means, said metering means comprising a pair of counter-rotating rollers having radial projections which are in substantial alignment at the point of closest approach of the rollers to each other,

opening means located adjacent said metering means for opening the stream metered by said metering means to form individual separated shredded tobacco particles in

the form of a falling shower, said opening means comprising a roller located below said rollers of said metering means and equidistant therefrom, said opening means rollers having radial projections which interdigitate with the radial projections of said metering means rollers,

horizontally-extending conveyor means located below said opening means and in the intended path of said falling shower to collect the shredded tobacco particles of the shower to form a stream of tobacco particles on said conveyor means, and

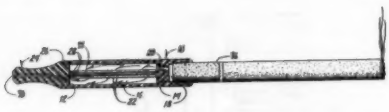
rotary drum means located at the downstream end of said conveyor means for receiving said stream of tobacco particles from said conveyor means for tumbling and mixing the same in said drum means while said particles are conveyed therethrough.

4,557,279

METHOD AND DEVICE FOR DISCOURAGING CIGARETTE SMOKING

William C. Fuerste, 1360 S. Grandview, Dubuque, Iowa 52001

Filed Aug. 11, 1983, Ser. No. 521,977
Int. Cl.[4] A24D *3/04*
U.S. Cl. 131—270 **4 Claims**



1. The method of discouraging cigarette smoking, comprising,

taking a cigarette filter means having a mouthpiece oppositely disposed from a cigarette retention means with a transparent therebetween,

taking a substantially impervious filter paper and treating a portion thereof to create a pervious portions in said filter paper that will define at least a word directed to the dangers of smoking, with said word being substantially invisible to the naked eye,

imposing said paper in said passageway so as to close the free passage of smoke from said cigarette retention means to said mouthpiece,

placing a cigarette in said cigarette retention means,

lighting said cigarette,

withdrawing smoke from said lighted cigarette through said passageway so that smoke from said lighted cigarette will move from the cigarette through the pervious portions in said paper to said mouthpiece, whereupon the letters of said word will entrap particles from said smoke so as to make visible the letters of said word.

4,557,280

PROCESS FOR REDUCTION OF NITRATE AND NICOTINE CONTENT OF TOBACCO BY MICROBIAL TREATMENT

Lawrence E. Gravely, Louisville, Ky.; Vernon L. Geiss, Floyd Knobs, Ind., and Charles F. Gregory, Middletown, Ky., assignors to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed Jun. 15, 1978, Ser. No. 916,322
Int. Cl.[4] A24B *3/14, 15/02*
U.S. Cl. 131—297 **35 Claims**

1. A process for reducing the nitrate and nicotine content of tobacco comprising:

(a) contacting tobacco with an aqueous medium containing a nitrate containing compound and a microorganism which degrades the nitrate and nicotine content of said tobacco, said microorganism being *Cellulomonas* sp.; and,

(b) maintaining said tobacco in contact with said microorganism for about 18 hours at a temperature of from about 20° C. to about 40° C.

10. A process for reducing the nitrate and nicotine content of tobacco comprising the steps of:

(a) mixing tobacco into an aqueous solution;

(b) removing the tobacco from the aqueous solution whereby a tobacco extract broth is left;

(c) adding *Cellulomonas* sp. to the broth;

(d) incubating the *Cellulomonas* sp.;

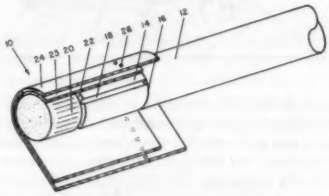
(e) adding the incubated *Cellulomonas* sp. in said broth to said tobacco.

4,557,281

FILTERED CIGARETTE

Elmer F. Litzinger, Jr., Louisville, Ky., assignor to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed Dec. 5, 1983, Ser. No. 558,221
Int. Cl.[4] A24D *3/04*
U.S. Cl. 131—336 **7 Claims**



1. A cigarette comprising:

a generally cylindrically shaped tobacco column;

a generally cylindrically shaped impermeable plug located in coaxial abutment to one end of the tobacco column;

a plurality of grooves formed in the periphery of the plug, the grooves extending generally longitudinally of the plug from one end to the other end of the plug;

a generally cylindrically shaped filter rod located in coaxial abutment with the plug; and,

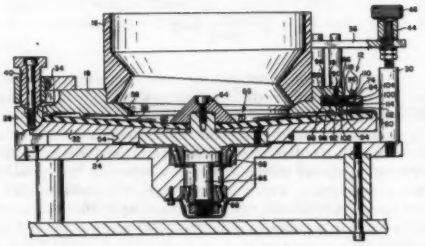
means defining an annular groove at the interface of the impermeable plug and filter rod in flow communication with each of the grooves of the plug and with the filter rod, the annular groove is formed in the filter rod.

4,557,282

COIN-SORTING WHEEL AND COUNTER FOR HIGH-SPEED COIN-SORTING AND COUNTING APPARATUS

Roger K. Childers, Tigard; Kenneth L. Buchanan, Troutdale, and Andrew L. Trumbo, Beaverton, all of Oreg., assignors to Childers Corporation, Wilsonville, Oreg.

Filed Aug. 25, 1983, Ser. No. 526,421
Int. Cl.[4] G07D *3/00*
U.S. Cl. 133—3 A **29 Claims**



8. A coin-engaging apparatus for use with a coin-sorting machine having a rotatable flexible surface, comprising:

an elongated support member mountable substantially coaxially within a generally horizontally oriented elongated receiver opening of said machine, said support member being rotatably and axially positionable within said receiver opening, said support member having an end portion extending outward beyond said receiver opening rotatably supporting a coin-engaging wheel for rotation about an axis eccentric with said support member, said coin-engaging wheel being positionable above said surface for engaging coins carried thereon; and

means for lockably retaining the position of said support member within said receiver opening during operation of said machine.

4,557,283

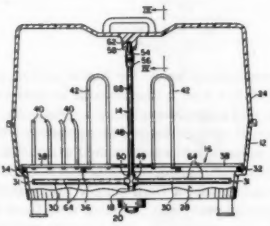
DISHWASHER

John B. Shaw, 4425 Gateway Dr., Monroeville, Pa. 15146

Filed Apr. 23, 1984, Ser. No. 602,804

Int. Cl.[4] B08B *3/02*

U.S. Cl. 134—177 **10 Claims**



1. In a portable, water-pressure powered dishwasher, the combination comprising:

a nozzle structure rotably supported at each of opposite ends thereof within the dishwasher for rotation about a substantially vertical axis,

a unitary dish rack adapted to be supported within the dishwasher in surrounding relationship with said vertical axis intermediate the axial ends of said nozzle structure,

said nozzle structure comprising an upstanding tubular spindle portion having a tee connected in fluid communication with the upper end thereof, a pair of tubular media dispensing lower arms extending radially outward in opposite directions from the lower portion, a pair of tubular media dispensing upper arms joined to extend radially in opposite directions from said tee in fluid communication with said tubular spindle portion, a fluid impervious stub connected to said tee to extend vertically in a coaxial relation with said vertical axis, an upper end portion of said stub forming a first rotary bearing surface, and means for rotably supporting a lower end portion of said upstanding tubular spindle portion,

said dish rack including radially extending elements connecting inner and outer rings for supporting articles to be washed within the radially outer extent of said upper arms, said radially extending elements projecting within the radially outermost sweep of said upper arms from said inner ring which is outside the outermost sweep of the upper arms to form vertical pathways between the radially extending elements for said upper arms during replacement of the dish rack with the nozzle structure in situ, and

a removable cover for the dishwasher which encloses said nozzle structure and said dish rack within the dishwasher, said cover including a second rotary bearing surface cooperable with said first rotary surface to rotatively support an upper end portion of said nozzle structure when said cover is in place on the dishwasher.

4,557,284

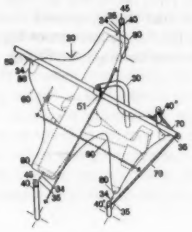
AIRCRAFT HANGER

W. Randall Bray, P.O. Box 331, Wilmington, N.C. 28402

Filed Nov. 13, 1984, Ser. No. 671,097

Int. Cl.[4] E04B *1/347*

U.S. Cl. 135—115 **5 Claims**



1. An aircraft cover structure for covering an aircraft having fuselage and appended outwardly extending wing structure while parked in a defined area on a parking surface, comprising:

(a) a plurality of vertical-supporting, ground-anchored pylons extending upwardly from the parking surface, outwardly from the parking area in which the aircraft is parked and with at least one of such pylons having an outer-elevated, horizontally-positioned end overlying the parking area;

(b) an elongated tubular boom having one pylon-supported end supported by and secured to tethers which in turn are secured to and supported by upper ends of an opposed pair of said pylons, an intermediate connection substantially at the midpoint of the boom supported by said overlying pylon and an opposite cantilevered end pointed in the direction of aircraft egress and aligned with the longitudinal axis of the aircraft fuselage during parking; and

(c) a fabric cover supported by all of the pylons and the boom in a manner in which certain of the pylons treated as anchor pylons are adapted to hold the fabric down and said overlying pylon and boom are adapted to hold the fabric up and to create a structural double curvature of the fabric surface and to place the fabric in tension.

4,557,285

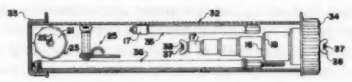
PLUGGING A CUT PIPE FOR SOLDERING A FITTING

Michael Baron, Winnipeg, Canada, assignor to Baron Enterprises Ltd., Winnipeg, Canada

Filed Jan. 18, 1984, Ser. No. 571,807

Int. Cl.[4] F16K *43/00*

U.S. Cl. 137—15 **12 Claims**



10. A method of attaching a fitting to a pipe using a tool for plugging the pipe comprising a shaft, a sleeve surrounding the shaft, a screw threaded portion at one end of the shaft, a nut for engaging the screw threaded portion, cylindrical resilient plug member for mounting on the end of the shaft remote from the screw threaded portion and arranged such that rotation of the nut and the screw threaded portion causes relative axial movement of the sleeve and the shaft axially compressing the resilient plug member so that the plug expands radially into contact with the inside surface of the pipe to plug the pipe, the radial extend of the shaft, sleeve, nut and plug being less than that of the pipe, the method comprising attaching a stop member to

the shaft at such a position that with the shaft extending through the fitting, the nut is just exposed, cutting the pipe, inserting the plug member and shaft into the pipe until the stop engages the end of the pipe, rotating the nut to radially expand the plug to plug the pipe, the length of the shaft being such that the plug member is located within the pipe at least four inches from the end of the pipe, removing the stop member, applying the fitting over the shaft to engage said cut end, soldering the end of the pipe to the fitting and removing the plug member and shaft from the pipe through the fitting.

4,557,286

BALL VALVE WITH EMERGENCY SEALING DEVICE

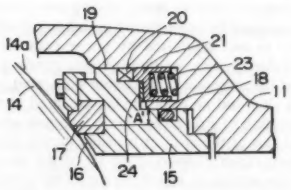
Tsutomu Nagano, Kitakoma, Japan, assignor to Kitz Corporation, Tokyo, Japan

Filed Dec. 5, 1983, Ser. No. 559,291

Claims priority, application Japan, Dec. 22, 1982, 57-193060[U]

Int. Cl.⁴ F16K *13/04*

U.S. Cl. 137—74 **9 Claims**



1. A ball valve with an emergency sealing device, which comprises a ball provided with a through hole at the center thereof and rotatably disposed within a valve body, ball seat retainers interposed between said valve body and said ball and each provided on part of the outer circumference thereof integrally with an annular projection surface, ball seats made of a heat destructible elastic material, attached one each to said ball seat retainers and adapted to be brought into sealing contact with the surface of said ball, said ball seat retainers each having a metal-contact portion to be brought into sealing contact with the surface of said ball only in case of emergency and said metal-contact portion having a diameter smaller than that of said ball seats, and the outer circumference of said annular projection surface being radially outwardly of said ball seat, first sealing rings made of a heat destructible elastic material and attached to portions of the outer circumferences of said ball seat retainers where they contact the inner circumference of said valve body for carrying out a sealing function under normal conditions, second sealing rings made of a heat resistant flexible material and attached to portions of the annular projection surfaces of said ball seat retainers where they oppose the inner circumference of said valve body for carrying out a sealing function only in case of emergency, and pressing mechanisms disposed between the inner surface of said valve body and the outer surfaces of said ball seat retainers and adapted to urge said ball seat retainers toward the ball under normal conditions and, in case of emergency, to press said ball seat retainers and compress said second sealing rings toward said ball, said second sealing rings having a diameter larger than that of said first sealing rings.

4,557,287

PRESSURE CONTROL VALVE FOR FUEL INJECTION PUMPS

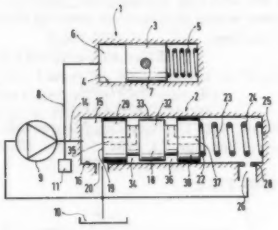
Helmut Laufer, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 25, 1984, Ser. No. 664,890

Claims priority, application Fed. Rep. of Germany, Nov. 15, 1983, 3341300

Int. Cl.⁴ G05D *24/00*

U.S. Cl. 137—115 **5 Claims**



1. A pressure control valve for fuel injection pumps, comprising a cylinder; a piston displaceable in said cylinder by a pressure fluid, said cylinder enclosing a spring chamber formed at one end face of said piston and being relieved by a throttle, and a control pressure chamber formed at another end face of said piston; a restoring spring positioned in said spring chamber and loading said piston; a fluid supply pump supplying fluid into a fuel injection pump space loaded with fluid, the pressure of which is to be controlled, said control pressure chamber being connected to said space to admit the pressure fluid, whereby the piston is adjustable by the fluid pressure against the force of said restoring spring; a pressure fluid-unloading tank connected to said throttle, said cylinder being formed at said pressure control chamber with a downflow opening connected to said fluid unloading tank and controlled by said piston upon the displacement thereof in said cylinder, said piston being positioned in said cylinder with an annular gap provided between an outer periphery of the piston and a peripheral wall of said cylinder, said annular gap forming a connection between said control pressure chamber and said spring chamber, said piston having at the periphery thereof at least one guiding portion, at which the piston is guided with a close fit relative to said peripheral wall of the cylinder, and another piston portion forming with said peripheral wall said annular gap, said guiding portion being formed with at least one passage which is connected to said another end face of the piston and opens at the periphery of the piston between said one portion and said another portion.

4,557,288

CLOSURE-ASSISTED CARTRIDGE-TYPE FLOW CONTROL VALVE

Irlin H. Botnick, Pepper Pike, Ohio, assignor to Josam Developments, Inc., Cleveland, Ohio

Continuation-in-part of Ser. No. 286,949, Jul. 27, 1981, abandoned, which is a continuation of Ser. No. 52,976, Jun. 28, 1979, abandoned. This application Aug. 16, 1982, Ser. No. 408,448

Int. Cl.⁴ F16K *43/00*

U.S. Cl. 137—315 **9 Claims**

1. A cartridge-type valve having a valve element movable toward and away from a valve seat, comprising:

a housing, the housing having inlet and outlet openings for the admittance and discharge of fluid, respectively;

a valve seat located adjacent the outlet opening;

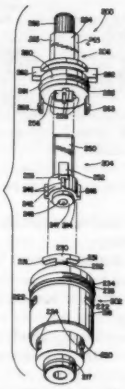
a piston movable axially within the housing, the piston having a cylindrical body portion, a sealing member at one end of the body portion engageable with the valve seat to

effect a fluid-tight seal, a driven portion at the other end of the piston, cam followers projecting laterally outwardly from the body portion, and a plurality of radially extending ribs engageable with the inner surface of the housing, the ribs defining a space between the inner surface of the housing and the outer surface of the body portion through which fluid can flow;

a drive member engageable with the driven portion of the piston, at least a portion of the drive member being disposed within the housing, movement of the drive member being such as to cause the piston to be moved axially within the housing, the drive member being in engagement with the piston with a non-cylindrical drive connection to apply rotational but no axial force to the piston;

at least one cam surface included as part of the housing, the cam followers being engageable with the cam surface, the cam surface having a contour such that, upon rotation of the piston, the piston is moved axially within the housing, the cam surface and the cam followers being disengaged upon contact between the piston and the valve seat; and

the inlet opening being positioned with respect to the piston and the piston being positioned with respect to the outlet opening such that the fluid always urges the piston toward engagement with the valve seat.

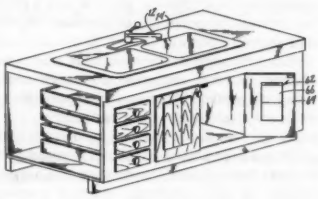


4,557,289

HOSE NOZZLE FOR FIRE FIGHTING KIT

Richard A. Kasnick, 5481 Vanderbilt Rd., Old Hickory, Tenn. 37138

Filed Mar. 26, 1984, Ser. No. 593,402
Int. Cl.[4] B65H *75/36*
U.S. Cl. 137—355.28 **11 Claims**



1. A quick-attach fire fighting kit adapted for connection to a water faucet having an aerator thereon, comprising,

a portable container,

a hose folded in said container and having a nozzle on one end and a quick-attach means on the other end,

an adapter for replacing the aerator on a faucet, said adapter having opposite ends, an intermediate body portion and a center longitudinal bore extending from end to end, one end being threaded for connection to a faucet upon removal of the aerator therefrom, the other end including an end insert portion and a reduced diameter portion between said end insert portion and intermediate body portion,

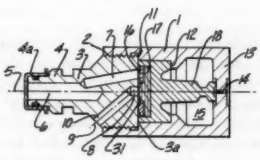
said quick-attach means comprising a tubular fitting having a free end and an opposite end adapted for connection to the hose, a guide means slidably mounted on said fitting and movable between connection and disconnection positions, spring means on said tubular fitting normally urging said collar into said connection position; said tubular fitting being adapted to receive the end insert portion of said adapter when said guide means is in its disconnection position, said guide means being adapted to lock said adapter within said tubular fitting when in said connection position.

4,557,290

HYDRAULIC SLIDE CONTROL SAFETY VALVE FOR A MINE SUPPORT JACK

Roger Chanal, Saint Etienne, and Daniel Cotte, Le Chambon Feugerolles, both of France, assignors to Bennes Marrel, France

Filed Nov. 21, 1984, Ser. No. 673,866
Claims priority, application France, Nov. 25, 1983, 83 19175
Int. Cl.[4] F16K *31/12*
U.S. Cl. 137—510 **13 Claims**



1. A safety valve for a hydraulic device comprising:

a barrel having an open end and a bottom surface enclosing a second end;

a seat demountably affixed in said open end of said barrel, said seat having a bearing surface defining a rear chamber in said barrel;

a resilient gasket member positioned in said rear chamber of said barrel, said resilient gasket member having a counterbore adjacent said bearing surface and a leg compressably positioned on said bottom surface of said barrel, said leg preloading said resilient gasket member in a direction away from said bottom surface of said barrel;

an inflation orifice positioned in said bottom surface of said barrel, said inflation orifice for delivery of pressurized gas into said rear chamber of said barrel whereby said resilient gasket member is pressed by said pressurized gas in a direction away from said bottom surface of said barrel;

an inlet passage located in said seat for delivery of hydraulic fluid from said hydraulic device into said counterbore of said resilient gasket member;

an outlet passage located in said seat for delivering hydraulic fluid from said counterbore of said resilient gasket member to a location external of said safety valve; and

means for selectively passing hydraulic fluid from said inlet passage to said outlet passage, said means for selectively passing positioned in said counterbore of said resilient gasket member, said means for selectively passing positioned in said counterbore of said resilient gasket member operable for passing hydraulic fluid when hydraulic fluid of a predetermined pressure is in said inlet passage.

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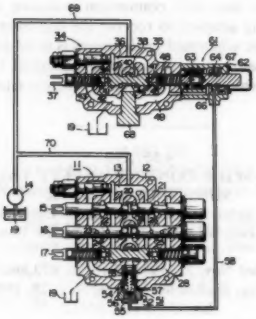
MULTIPLE CONTROL VALVE SYSTEM

Yutaka Hashimoto, Ayase, Japan, assignor to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 336,268, Dec. 31, 1981, abandoned.
This application Sep. 21, 1984, Ser. No. 654,035
Claims priority, application Japan, Jan. 13, 1981, 56-3414
Int. Cl.[4] F15B *13/08*
U.S. Cl. 137—596.13 1 Claim



1. A multiple control valve system comprising:

a multiple control valve having an oil inlet chamber connected to an external pressurized oil source, oil passages inclusive of a center by-pass passage and a side passage, connected to said oil inlet chamber, a plurality of spools for communicating an upstream side of said center by-pass passage with a downstream side thereof at a neutral position of the spool and throttling said center by-pass passage during the movement in a direction towards and away from the neutral position of the spool and for changing over flow direction of the pressurized oil passing through said side passage, and a return passage for said pressurized oil;

an additional attachment valve operatively connected to said multiple control valve and having an oil inlet chamber connected to said external pressurized oil source, oil passages connected to said oil inlet chamber of said attachment valve, a return passage, and a spool for changing over flow direction of the pressurized oil passing through said oil passages of said attachment valve, said inlet chambers of said multiple control valve and said attachment valve being parallelly connected to said pressurized oil source;

a logic valve oil-tightingly attached to said multiple control valve in a tandem manner with respect to said center by-pass passage so as to communicate with said oil passages formed in said multiple control valve at a position between said downstream side of said center by-pass passage and said return passage of said multiple control valve for controlling the communication with said oil passages by the operation of said attachment valve; and

a changeover valve provided with a portion connected to said spool of said attachment valve so as to communicate with said return passage of said attachment valve and connected to said logic valve through a conduit so that a pilot chamber of said logic valve is connected to an oil tank at the neutral position of the spool and the connection between said pilot chamber and said oil tank is interrupted at a position other than the neutral position of the spool.

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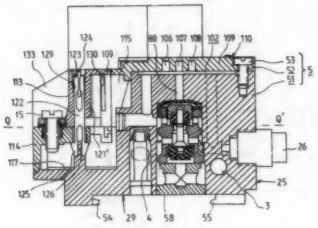
SYSTEM FOR DISTRIBUTING PNEUMATIC CONTROL SIGNALS BY ELECTRICAL MEANS

Michel Nicolas, Plaisir, and Pierre Prudhomme, Saint Germain en Laye, both of France, assignors to La Telemecanique Electrique, Nanterre, France

Filed Feb. 24, 1983, Ser. No. 469,599
Claims priority, application France, Feb. 24, 1982, 82 03009
Int. Cl.[4] F15B *13/08*
U.S. Cl. 137—596.16 7 Claims



1. System for distributing pneumatic control signals by electrical means comprising:

(A) an elongated support element having a longitudinal axis and first securing means;

(B) a plurality of adjacent base modules each having a first body comprising:

a securing surface having second securing means adapted for engaging with and fixing on said first securing means;

a first association surface opposite to the securing surface and substantially parallel thereto, said first association surface having a first and second lateral areas, said first lateral area being provided with first, second and third orifices;

first and second opposite coupling surfaces which are parallel to each other and perpendicular to said axis said first coupling surface comprising first and second openings and said second coupling surface comprising first and second openings respectively coaxial to the first and second openings of the first coupling surface so that in coupling engagement of two base modules by the respective first and second coupling surfaces thereof, said first and second openings of one base module are respectively in communication with the first and second openings of a corresponding coupling surface of an adjacent base element;

first and second opposite end surfaces respectively adjacent to said first and second lateral areas, said first end surface having an aperture provided with a pneumatic connection;

a pressurized feed channel portion and a discharge channel portion respectively connecting together said first and second openings of said first and second coupling surfaces through the base element, said pressurized feed channel portion and said discharge channel portion being respectively connected to said first and second orifices of said association surface;

a pneumatic amplifier located inside said body and comprising a pressurized feed inlet connected to said pressurized feed channel portion, a discharge outlet connected to said discharge channel portion, a service outlet connected to said pneumatic connection and a control inlet connected to the third orifice of said association surface, and obturating means actuated from the pressure occuring at the control inlet in such a way as to connect said service outlet directly to the said pressurized feed inlet when pressure at the control inlet is higher than a predetermined pressure level and to con-

nect said service outlet to the discharge outlet when pressure at the control inlet is lower than said predetermined level;

(C) a plurality of electromagnetic valve modules each comprising:

a second body having a second association surface adapted to be adjusted onto said first association surface of one corresponding base element in a coupling arrangement and including an inlet opening, an outlet opening, an exhaust opening so that in said coupling arrangement, said inlet orifice, said exhaust opening and said outlet opening communicate respectively with said first, second and third orifices of said first association surface of the base module;

a control electromagnet located in said second body and having a coil, a movable armature having at least first and second positions, valve means including actuation means connected to said armature, a pressure duct connected to said inlet opening, a first exhaust duct connected to said exhaust opening, an outlet duct connected to said outlet opening and a valve member controlled by said actuation means for connecting said outlet duct with said pressure duct when said armature is in the first position and for connecting said outlet duct with said first exhaust duct when said armature is in said second position;

said second lateral area of said first association surface comprising at least first and second windows;

said second coupling surface of each base module comprising a third window;

first and second electrical female coupling members being located in each base element and respectively debouching into said first and second windows, perpendicularly to said first association surface and a third female electrical coupling member being located in the base module and debouching into said third window perpendicularly to said second coupling surface;

said second end surface being provided with an electrical connection device;

said first electrical coupling member being connected to said electrical connection device by electrical conducting means passing through said base module;

said second electrical coupling member being connected to said third female coupling member by a conducting piece which has a male electrical coupling member projecting beyond said first coupling surface parallel to said longitudinal axis and coaxially to said third female member so that in mutual engagement of two adjacent base modules, the male electrical coupling member can penetrate into said third female electrical coupling member

said second association surface of electromagnetic valve modules comprising at least first and second electrical connection terminals connected to said coil and projecting from said second surface so that in said coupling arrangement, said first and second electrical connection terminals are electrically coupled with said first and second electrical coupling members of said base element.

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ARRANGEMENT FOR CONTROLLING AN ELECTRO-HYDRAULIC VALVE

Guy Guens, Hemhofen, and Karl Krieger, Wuppertal, both of Fed. Rep. of Germany, assignors to Hermann Hemscheidt Maschinenfabrick GmbH & Co., Wuppertal, Fed. Rep. of Germany

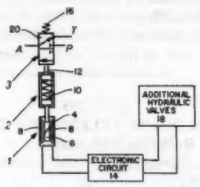
Filed Jul. 29, 1983, Ser. No. 518,128

Claims priority, application Fed. Rep. of Germany, Aug. 11, 1982, 3229835

Int. Cl.⁴ F16K *31/06*

U.S. Cl. 137—625.65 **4 Claims**

1. An electro-hydraulic valve assembly, especially a valve assembly for controlling self-advancing hydraulic mine-roof supports, comprising an electro-magnet with a movable armature and with a coil connected to an intrinsically-safe electrical circuit, an hydraulic directional valve having a movable valve-closure body which is held in a starting position by spring force means and which is movable into a switched position via a push-rod switch device against the force of the spring force means by the armature of the electro-magnet when the coil thereof is supplied with the full electrical power of the circuit, the armature being adapted to perform a greater displacement stroke than the closure body of the valve and being arranged to further stress a pre-stressed spring buffer arranged between the armature and the push-rod switch following on switching movement of the valve, a housing of the electro-magnet against which a surface of the armature rests in direct contact when the valve is in the switched position so as to generate a



remanence force, and electronic means connected to the coil of the electro-magnet so that, after completion of the switching, the voltage applied to the coil is reduced by the electronic means to a value where the magnetic force acting on the armature is weaker than the force of the spring force means, the closure body of the valve being held nonetheless in the switched position by the now-weaker magnetic force induced by the reduced residual voltage combined with the remanence force, the further-stressed spring buffer, on switching-off the residual voltage, being sufficiently strong to move the armature towards its initial starting position and, therefore, to produce an air-gap between the magnet housing and the armature which eliminates the remanence force whereby the valve-closure body is returned to the starting position by the spring force means.

4,557,294

CONTROL VALVE WITH PISTON COMPENSATED BY DISCHARGE PRESSURE

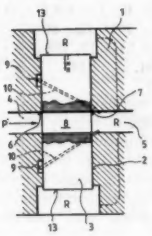
Rudolf Brunner, Baldham, Fed. Rep. of Germany, assignor to Die Heilmeier & Weinlein Fabrik für Oel-Hydraulik GmbH & Co. KG, Munich, Fed. Rep. of Germany

Filed Jan. 18, 1984, Ser. No. 571,728

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1983, 3308574; European Pat. Off., Dec. 9, 1983, 83112425.0

Int. Cl.⁴ F15B *13/02*

U.S. Cl. 137—625.68 **20 Claims**



1. A hydraulic control valve particularly for use in a high pressure hydraulic system wherein a plurality of control valves are combined in a battery-type arrangement, comprising a

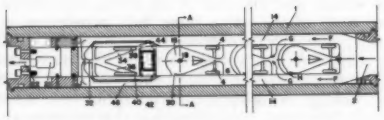
housing (1, 1', 1'') formed with a housing bore (2), a control piston (3, 3', 3'', 3''', 3'''', 3^{IV}) being guided in said housing bore between a neutral position for zero-pressure through-flow for controlling the flow of a working medium and at least one control position, and further comprising a pressure inlet (4) opening into said housing bore and being communicable with a pump passage (P) supplied with pump pressure, a through-passage (8) in said control piston adapted to be aligned with said pressure inlet, a pair of consumer connection passages (V1,V2) each for receiving pressure medium in respectively different control positions of the piston, and a discharge outlet (5) communicating with said pressure inlet via said through-passage in the zero-pressure through-flow position, characterized in that substantially diametrically opposite said discharge outlet (5) there is provided at least one relief area (9, 9', 16, 17, 18, F26) for the circumferential surface of said control piston together with a channel for communicating discharge pressure thereto for compensating the effective area of said discharge outlet (5), the effective area of said relief area being substantially of the same size as that of said discharge outlet.

4,557,295

FLUIDIC MUD PULSE TELEMETRY TRANSMITTER

Allen B. Holmes, Rockville, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 9, 1979, Ser. No. 93,084
Int. Cl.[4] F15C *1/16*
U.S. Cl. 137—813 **19 Claims**



1. A fluid control device comprising:
at least two vortex valves arrayed in parallel; and
common regulating means to regulate the flow to said valves by selectively passing flow to one of two paths to control the amount of flow through the valves, wherein said regulating means comprises
a first fluid amplifier having outlet paths, and
at least two second fluid amplifiers associated respectively with said at least two vortex valves, and second fluid amplifier having first and second outlet paths communicating with its associated vortex valve and having control ports for controlling the flow of fluid in the second fluid amplifier, the outlet paths of said first fluid amplifier communicating with the control ports of said second fluid amplifiers.

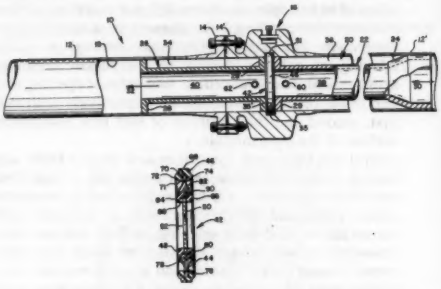
4,557,296

METER TUBE INSERT AND ADAPTER RING

Thomas E. Byrne, P.O. Box 80123, Midland, Tex. 79709

Filed May 18, 1984, Ser. No. 611,831
Int. Cl.[4] F16L *55/10*; F15D *1/02*
U.S. Cl. 138—44 **15 Claims**

1. In a meter run having a meter tube fitting with a meter tube insert included therein by which the orifice to pipe diameter ratio may be improved, wherein said meter tube fitting has confronting annular faces which form a cavity, an said tube inserts has confronting flange faces aligned with the confronting faces of the meter tube fitting, the combination with said meter tube fitting and meter tube insert of an adaptor apparatus;
said adaptor apparatus has an outer annular resilient gasket for sealingly engaging the annular confronting faces of the meter tube fitting; an annular body carried on the interior of the outer gasket, said annular body has an axial passageway formed therethrough of reduced diameter respective to the inside diameter of the outer annular gasket;
an inner annular gasket of resilient material, said inner annular gasket has an outer seal surface formed thereon which is sealingly received within said axial passageway;



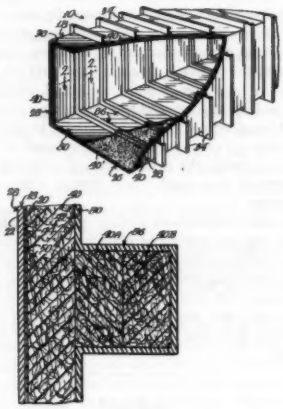
an annular orifice plate, said inner annular gasket has a groove formed about the interior thereof by which the outer circumferentially extending marginal edge of said plate is received therewithin, whereby said outer gasket supports said annular body, said annular body supports said inner gasket, and said inner gasket supports said orifice plate.

4,557,297

FLUE GAS DUCT ASSEMBLY

Frank J. Montana, Western Springs, Ill., assignor to Bisco Products, Inc., Park Ridge, Ill.

Division of Ser. No. 472,635, Mar. 7, 1983, Pat. No. 4,467,863. This application Apr. 2, 1984, Ser. No. 596,059
Int. Cl.[4] F16L *11/12*
U.S. Cl. 138—141 **6 Claims**



1. In an outer support duct subject to corrosion from heated corrosive gases and condensate which may form, the improvement comprising a length of longitudinally extending inner structure designed to operate at, and accommodate, the gas temperatures while eliminating or minimizing the gas corrosion of the outer support duct interior, said inner structure including:
a substantially gas-tight liner disposed within the interior of said outer support duct, said liner having sufficient thickness and rigidity to self-maintain the liner transverse configuration in general conformity with the transverse con-

figuration of said outer support duct and with the liner being spaced from said outer support duct, said liner being fabricated from a material substantially resistant to said corrosive gases and condensate, said liner defining a plurality of corrugation means extending generally transversely of said liner at longitudinally spaced locations along the length of the liner for accommodating longitudinal thermal expansion of the liner by bellows-like elastic deformation and for functioning as rigidifying stiffeners of the transverse cross section of the liner; and

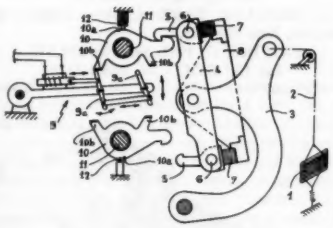
a spacer material disposed between said outer support duct and said liner, said spacer material having an inner surface and an outer surface with the spacer material outer surface substantially covering the inner surface of said outer support duct, at least said inner surface of said spacer material being movable generally parallel to the inner surface of said outer support duct under the application of relatively low shear forces imposed on the inner surface of the spacer material in directions parallel to the inner surface of said outer support duct to thereby minimize resistance to the thermal expansion of said liner in directions parallel to said outer support duct inner surface, at least a portion of said spacer material that covers a portion of the interior transverse cross section perimeter of said outer support duct also being movable generally normal to the inner surface of said outer support duct under the application of relatively low compression forces imposed on the inner surface of the spacer material by the liner in directions normal to the inner surface of said outer support duct to thereby minimize resistance to the thermal expansion of said liner transversely of said duct.

4,557,298

DOBBIES INCORPORATING DOUBLE SWINGING LEVERS FOR WEAVING LOOMS

Jean-Paul Froment, Doussard, France, assignor to S.A. des Etablissements Staubli, Faverges, France

Filed Mar. 9, 1984, Ser. No. 588,167
Claims priority, application France, Mar. 22, 1983, 83 04883
Int. Cl.⁴ D03C *1/06*
U.S. Cl. 139—71 **5 Claims**



1. In a weaving-loom dobby of the type having a fixed frame and having multiple actuating levers attached to associated heddles and carrying rocking levers each having two spaced coupling hooks, and the dobby having for each coupling hook a selection hook means including a hook body pivotally supported by a pin carried by said fixed frame and including a hook nose for engaging a coupling hook, each selection hook means being displaceable by a pattern reading device between a coupling-hook engaging position and a retracted position, improved dobby structure comprising:

heel means associated with each selection hook means and contactable by the reading device to pivot said body and displace it between said positions;

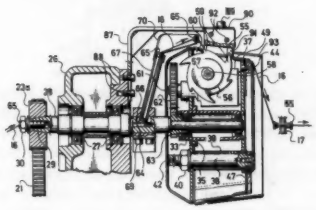
and releasable retaining means coupled between said fixed frame and the body of each selection hook means and operative to stably retain the selection hook body in whichever of said positions the reading device last displaced it and until displaced thereby to a different position, each releasable retaining means comprising a pawl rockably carried by the fixed frame and having a nose, and said body of the selection hook having shoulder means thereon engageable by said pawl nose, and elastic means yieldably urging the hook body to pivot into one position and urging the pawl nose against a shoulder means in the other position, whereby to releasably retain the body in the other position when displaced thereinto.

4,557,299

METHOD OF AND APPARATUS FOR SELECTIVELY RELEASING A PREDETERMINED LENGTH OF WEFT THREAD IN SHUTTLELESS LOOMS

Jindrich Henzl, Brno; Vladimir Kuda, Blazovice; Vladimir Vasicek, Moravsky Krum, and Stanislav Klimes, Brno, all of Czechoslovakia, assignors to ZVS Vyzkumnevyvojovy Ustav Koncernova Ucelova Organizace, Brno, Czechoslovakia

Filed Mar. 23, 1984, Ser. No. 593,021
Claims priority, application Czechoslovakia, May 16, 1983, 3398-83
Int. Cl.⁴ D03D *47/36*
U.S. Cl. 139—452 **8 Claims**



1. Apparatus for selectively releasing a predetermined length of weft thread into the warp shed in shuttleless looms, comprising at least two continuously rotating metering devices attached to the frame of the machine, means for winding the weft thread about a supply drum and at each time period for separating a certain number of weft thread coils, corresponding to an insertion length of weft thread, by control means fast on the circumference of a separating wheel from the next weft thread windings and released into an inserting mechanism of the loom, the frequency of rotation of the two metering devices being chosen in such a way that said devices conjointly wind or release one insertion length of the weft thread for one weaving cycle, and at least one of them releases an insertion length of the weft thread in at least subsequent consecutive weaving cycles, the ratio of the frequencies of rotation of the metering devices being equal to the numbers of weft thread lengths released at each time period directly, one after another, by each of said devices, each of said devices comprising a box of the metering device, attached to the frame of the shuttleless loom in which there is mounted by means of first bearings a rotary hollow shaft having a guide flyer, at one end of which is secured a driven pulley conjointly rotatably connected by a transmission to a main shaft of the shuttleless loom, and at the other output end there is mounted in second bearings the supply drum consisting of at least one adjustable segment and at least one fixed segment, onto which the weft thread is continuously wound, in the fixed segment there being provided at least one groove for at least one separating wheel fast on a driven shaft of a gear box rotatably connected to said hollow shaft, the prepared weft thread winding corresponding to at least one insertion length of weft thread being displaced by the separating wheel along the supply drum in the direction of withdrawal of the weft thread, on the periphery of the separating wheel there being disposed control means, the weft thread winding, corresponding to the insertion of weft thread, always being displaced between two of said control means, the first control means in the direction of withdrawal of the weft thread

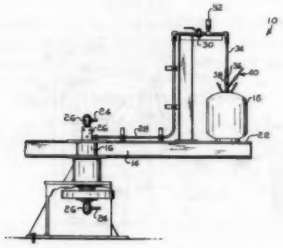
selectively releasing into the warp shed a winding of weft thread carried behind it, in accordance with a weft thread releasing program, on the periphery of the separating wheel there being disposed at least three control means at equal angular spacings, their different relative heights being determined by a program for releasing the weft thread into the warp shed, the angle included between the axis of the supply drum and the axis of the separating wheel is in the range of 1°–89°, and the control means distributed on the periphery of the separating wheel being formed as swingable dents.

4,557,300

METHOD OF AND APPARATUS FOR FILLING PRESSURIZED FLUID CONTAINERS

Robert H. Jernberg, East Hampton, Conn., assignor to Pressure Pak, Inc., East Hampton, Conn.

Filed Feb. 6, 1984, Ser. No. 576,936
Int. Cl.⁴ B65B *3/04*
U.S. Cl. 141—5 **25 Claims**



22. A method for the filling of pressure vessels with pressurized fluid, the pressure vessels being provided with integral flow control valve assemblies, said flow control valve asemblies including a housing and a conduit extending therefrom, said method comprising the steps of:

operating the pressure vessel flow control valves to the open state;

mounting quick-disconnect valve clamps on the pressure vessel flow-control valves to establish a fluid-tight connection between the conduit extending from the housing of the flow control valves and a normally closed valve disposed in the quick-disconnect valve clamp;

connecting a source of low pressure to the quick-disconnect valve clamps and simultaneously opening the normally closed valve therein whereby the pressure vessels will be evacuated;

disconnecting the vacuum supply from the quick-disconnect valve assemblies when the desired low pressure condition has been established within the pressure vessels and simultaneously closing the valve in said quick-disconnect valve assemblies whereby the established low-pressure condition in the pressure vessels will be maintained;

connecting a source of pressurized fluid to the quick-disconnect valve assemblies and simultaneously reopening the valves in the quick-disconnect valve assemblies whereby the pressure vessel will be filled with pressurized fluid;

disconnecting the pressurized fluid supply from the quick-disconnect valve assemblies and simultaneously closing the valves in the quick-disconnect valve assemblies after the pressure vessels have been filled to the desired degree with pressurized fluid, the closing of the valves in said quick-disconnect valve assemblies maintaining the pressurized fluid in the pressure vessels;

closing the pressure vessel integral flow-control valves; and

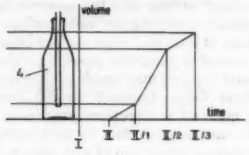
dismounting the quick-disconnect valve clamps from the pressure vessel valve bodies.

4,557,301

METHOD AND MEANS FOR FLOW REGULATION IN CONTAINER FILLING MACHINES

Norbert Jörss, Neutraubling, Fed. Rep. of Germany, assignor to Carl Pirzer, Fed. Rep. of Germany

Filed Nov. 8, 1983, Ser. No. 550,019
Claims priority, application Fed. Rep. of Germany, Nov. 9, 1982, 3241234; Sep. 29, 1983, 3335260
Int. Cl.⁴ B65B *3/04*
U.S. Cl. 141—5 **35 Claims**



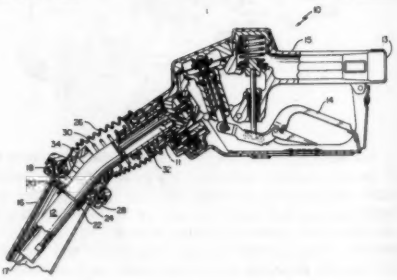
1. A method of controlling a filling machine for filling containers with a liquid, said filling machine having a filling valve, which comprises opening said filling valve to dispense liquid into a container through said filling valve, continuously measuring with a flow meter the quantity of liquid being dispensed, continuously generating from said measurement an electrical pulse stream corresponding to the quantity of liquid actually dispensed, continuously counting the number of pulses in said pulse stream and generating an electrical actual value signal, continuously comparing the electrical actual value signal with a first preselected electrical desired value signal, generating a first electrical control value signal when said actual value signal is equal to said first desired value signal, and terminating the dispensing by closing the filling valve in response to the first control signal.

4,557,302

RETAINER RING FOR THE SPOUT OF A FLUID DISPENSING NOZZLE

Charles A. Sunderhaus, Hamilton, Ohio, assignor to Dover Corporation, New York, N.Y.

Filed Dec. 17, 1981, Ser. No. 331,572
Int. Cl.⁴ B67C *3/34*; B65B *3/18*
U.S. Cl. 141—207 **14 Claims**



1. A fluid dispensing nozzle, said nozzle comprising:

a nozzle body, said body having an internal passageway, said body having an inlet and an outlet connecting said passageway;

means for selectively opening said internal passageway, said means allowing fluid flow between said inlet and said outlet;

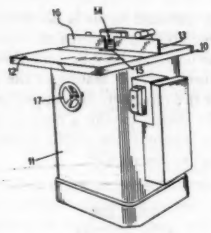
a dispensing spout, said dispensing spout being operatively connected to said outlet;

a vapor recovery system, said system comprising:
a shroud, said shroud having means for sealing said shroud to a fill tank opening;
a passageway, said passageway being formed between said dispensing spout and said shroud; the improvement comprising:
means for securing said dispensing spout in said fill tank opening, said means comprising:
at least one annular groove, said annular groove being formed in said spout, said annular groove extending about said spout's peripheral surface;
at least one retaining ring, said retaining ring being fitted in said annular groove, said ring extending radially beyond said spout's peripheral surface;
a retainer, said retainer being fitted about said spout, said retainer being abutted against said retaining ring, said retainer engaging said fill tank opening, said retainer preventing fluid vapor from escaping said fill tank opening; and
means for preventing axial movement of said retainer relative to said spout.

4,557,303
SPINDLE SHAPER

Gary L. Gardner, and Chester K. Greathouse, both of McMinnville, Tenn., assignors to Powermatic - Houdaille, Inc., McMinnville, Tenn.

Filed Jul. 23, 1984, Ser. No. 633,597
Int. Cl.[4] B27C *5/00, 5/06*
U.S. Cl. 144—145 A **12 Claims**



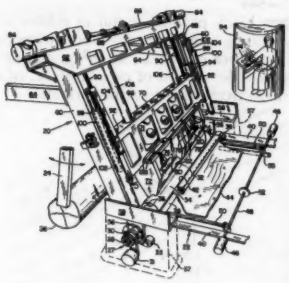
12. A single spindle multiple cutter shaper machine which comprises an upright base frame having a table top, a casing suspended from said table top, a vertical slide mounted on said casing, worm and gear means in said casing raising and lowering said slide, a handwheel projecting beyond the base frame for actuating said worm and gear means, an upright housing carried by said slide, an upright spindle rotatably mounted in said housing projecting above said table top, a stack of pulleys on said spindle under said housing, an upright electric motor mounted on said slide having a driven shaft, a stack of pulleys on said shaft, a belt connecting selected pulleys on the motor drive shaft and on the spindle to drive the spindle from the motor at a speed determined by the selected pulley combination, a stack of cutter heads removably mounted on the spindle above the table top and fluid pressure actuated means rapidly shifting said spindle from an initial adjusted position to a second position for a second cutting operation.

4,557,304
BLOCK STABILIZER FOR VENEER LATHE

Kenneth L. Shrum, Glide, Oreg., assignor to Sun Studs, Inc., Roseburg, Oreg.

Filed Mar. 29, 1984, Ser. No. 594,566
Int. Cl.[4] B27L *5/02*
U.S. Cl. 144—213 **12 Claims**

1. A block stabilizer for helping to control the position of a block of wood during cutting of veneer therefrom in a veneer lathe having a pair of spindles including chucks for gripping and rotating the block of wood and a veneer knife for cutting a thin sheet of veneer from the block while it is rotating, said spindles defining a spindle axis of rotation, the block stabilizer comprising:
(a) a pair of guides extending substantially radially with respect to said spindle axis of rotation of said veneer lathe;
(b) a block stabilizer head supported slidably on said guides for radial movement therealong defining a radial plane with respect to said spindle axis of rotation;

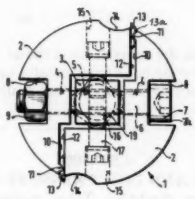


(c) parallel roller means mounted rotatably in said block stabilizer head and defining first and second roller axes of rotation located on opposite sides of said radial plane defined by said radial movement of said stabilizer head;
(d) biasing means for opposing a radially inward component of the weight of said stabilizer head; and
(e) controllable drive means for moving said stabilizer head radially with respect to said spindle axis of rotation during cutting of veneer from a block of wood in said lathe, in response to movement of said veneer knife.

4,557,305
CUTTER BLOCK FOR A MOTOR DRIVEN HAND PLANER

Günther Berger, Notzingen, and Alfred Frech, Stuttgart, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 25, 1983, Ser. No. 517,352
Claims priority, application Fed. Rep. of Germany, Oct. 22, 1982, 3239152
Int. Cl.[4] B26D *1/12*
U.S. Cl. 144—230 **20 Claims**



1. A cutter block for a motor driven hand planer, comprising:
a roller body having two profiled bodies cooperating with each other so as to support at least one movable knife;
means for supporting and driving the roller body, including a shaft connecting the profiled bodies and provided with at least one recess, and resilient means for centering the profiled bodies with respect to the shaft and located within the recess; and

means for tightening the profiled bodies for gripping the knife.

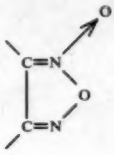
4,557,306

CARBON BLACK-FURAZAN OXIDE PRODUCT AND RUBBER COMPOSITIONS CONTAINING SAME

Daniel F. Graves, Clinton, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Jun. 18, 1984, Ser. No. 621,656
Int. Cl.[4] C08C *4/00*; C08K *5/35, 3/04*
U.S. Cl. 152—548 **26 Claims**

1. A carbon black product useful in rubber compositions prepared by heating a mixture which comprises carbon black having a surface area of at least 20 m^2/g. and up to 10% by weight, based on the weight of carbon black, of at least one aromatic furazan oxide of the partial formula



(I)

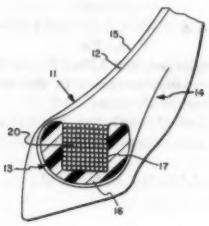
wherein the depicted carbon atoms are a part of a single fused aromatic ring at a temperature of from at least the melting point up to the decomposition of the furazan oxide.

4,557,307

PNEUMATIC TIRE

Frank Philpott, Kuala Lumpur, Malaysia, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Feb. 27, 1984, Ser. No. 584,284
Int. Cl.[4] B60C *15/04*; B29D *30/48*
U.S. Cl. 152—539 **2 Claims**



1. A tire wherein the support has a radial cross-section such that the channel therein has a substantially square cross-section and the outer surface of the support has a substantially circular cross-section.

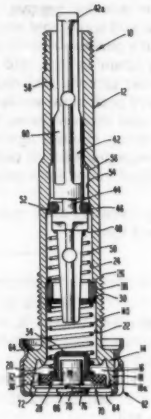
4,557,308

TIRE VALVE AND LOW PRESSURE INDICATOR

Harold A. Kuypers, Nashville, Tenn., assignor to Scovil Inc., Waterbury, Conn.

Continuation-in-part of Ser. No. 458,257, Jan. 17, 1983, abandoned. This application Jun. 18, 1984, Ser. No. 621,713
Int. Cl.[4] B60C *23/10*
U.S. Cl. 152—427 **12 Claims**

1. In a tire valve and low pressure indicator having a tubular body adapted to be mounted in the rim hole opening of a vehicle wheel and having a seat disposed inward of the rim in the tire chamber, a poppet seating on the seat and a spring in the tubular body compressively disposed against the poppet and urging it off its seat and indicator means disposed in the tubular body and adapted upon the unseating of the poppet to be driven by the air coming into the tubular body away from the seat to a signal position; the improvement of the tubular body having an annular projecting skirt outward from the seat, circular flexible baffle means carried by the poppet and extending outward therefrom, the periphery of the baffle means being proximate to the wall of the skirt when the poppet is open, the



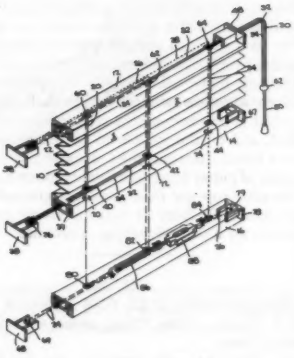
baffle means flexing outward as air is admitted past the seat into the tire chamber to permit increased flow between the baffle means and the wall, but limiting such flow in the opposite direction to assure a proper seating of the poppet by the pressure of air in the tire chamber, the poppet having a central recess and the baffle means having a central projection disposed in the recess whereby the baffle means is generally centered with respect to the poppet.

4,557,309

SUN BLIND

Ren S. Judkins, Salt Lake City, Utah, assignor to Verosol USA Inc., Pittsburgh, Pa.

Filed Aug. 24, 1983, Ser. No. 525,871
Int. Cl.[4] E06B *9/262*; A47H *3/10*
U.S. Cl. 160—84 R **5 Claims**



1. A sun blind comprising:
a first horizontal bar;
a second horizontal bar adapted for movement with respect to the first bar;

a foldable sun blinding member attached to said first and second bars;

a third bar disposed below the second bar;

first cord means for moving said second bar and said sun blinding member with respect to said first bar, said cord means coupled to and extending at least partly through said second bar in a direction substantially parallel to the longitudinal direction of said second bar, said sun blinding member having a plurality of aligned openings disposed therein, said cord means extending through apertures in said second bar aligned with said aligned openings in said sun blinding member and further being disposed in said plurality of openings, said cord means extending through apertures in said first bar aligned with said aligned openings in said sun blinding member and further extending at least partly through said first bar in a direction substantially parallel to the longitudinal direction of said first bar and exiting at a first end of said first bar and terminating in a pull cord operable to move said second bar, said first cord means comprising first and second cords and said plurality of aligned openings comprising first and second series of aligned openings disposed adjacent the ends of said sun blinding member, said first and second cords being disposed in respective ones of said first and second series of openings and coupled to one end of said second bar;

second cord means for guiding said sun blinding member and said second bar during movement of said sun blinding member and second bar, said second cord means being coupled to a second end of said first bar opposite said first end and extending at least partly through said first bar in a direction substantially parallel to the longitudinal direction of said first bar, through said apertures in said first bar and said plurality of aligned openings in said sun blinding member, through said apertures in said second bar in a direction substantially perpendicular to the longitudinal direction of said second bar, and through apertures in said third bar and at least partly through said third bar in a direction substantially parallel to the longitudinal direction of said third bar, said second cord means being coupled to said third bar, said second cord means comprising third and fourth cords disposed respectively in said first and second series of aligned openings, said tension means being disposed in said third bar, said third and fourth cords being coupled together by said tension means, said tension means maintaining said third and fourth cords in a taut condition, said second cord means further comprising fifth and sixth cords and said sun blinding member further including at least one third series of aligned openings disposed between said first and second series of aligned openings, said fifth and sixth cords being disposed in at least one of said third series of aligned openings, said fifth and sixth cords further extending through said third bar and being coupled together by said tension means; and

means for providing tension on said second cord means during movement of said second bar and said sun blinding member, said second cord means comprising an even number of at least four cords, thereby allowing said tension means to provide equal tension on said cords of said second cord means and allowing said second cord means to provide sufficient guidance for said sun blinding member.

4,557,310

MOVABLE SUN SHADE SYSTEM

Gerald J. Castellaw, 11670 Laurelwood Dr., Studio City, Calif. 91604; Ronald C. Wigham, 1192 Lundy Dr., Simi Valley, Calif. 93065, and Edwin N. Ames, 8585 Walnut Dr., Los Angeles, Calif. 90046

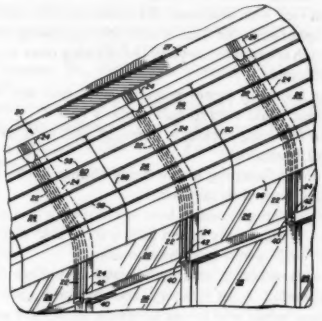
Filed Apr. 15, 1983, Ser. No. 485,182

Int. Cl.[4] A47H *5/00*

U.S. Cl. 160—84 R **8 Claims**

1. An improved moveable shade system in combination with a window, skylight or the like which lies in multiple planes, which planes lie at an obtuse angle with respect to one another, said window, skylight or the like including a first substantially vertically extending section and a second section inclined thereto forming said obtuse angle, each of said sections being supported by frame means in the form of mullions, said system further comprising, in combination:

(a) a plurality of substantially parallel, continuous spaced tracks lying in said multiple planes and mounted on said mullions, said tracks having significant lengths thereof lying respectively in each of said first and second sections, said tracks including a smoothly curved portion defining a transition portion between said sections;



(b) a plurality of shade carriers secured to and freely moveable along said tracks;

(c) a shade secured to said carriers adapted to move with said carriers along said tracks;

(d) shade urging means connected to said shade for urging said shade and carriers along said tracks from a first lowered position to a second raised position, and

(e) retaining means for securing and maintaining said shade in said second position,

(f) means for facilitating said shade to return to said first position by force of gravity when said retaining means is released and said shade urging means is deactivated.

4,557,311

PROTECTIVE COVERING

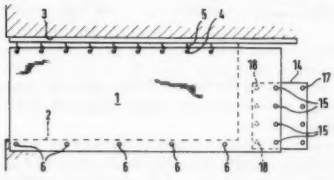
Kuno Reining, In der Stelle 15, 7765 Bodman, Fed. Rep. of Germany

Filed Apr. 21, 1983, Ser. No. 487,440

Claims priority, application Fed. Rep. of Germany, Apr. 21, 1982, 3214801

Int. Cl.[4] A47H *23/01*

U.S. Cl. 160—330 **5 Claims**



1. Protective covering to shelter from light, wind, and view, particularly at balconies of buildings, which covering is adapted to be stretched over an opening to be shielded, which opening is in a wall or between walls, comprising

upper, lower, and side walls,

a web made of foldable, weatherproof material and located

so as to be stretched over the opening to be shielded in said walls,

an upper member fixed to an upper wall and lower fasteners fixed to said lower wall,

said web connected to said upper member, and releasably connected to said lower wall when said web is in stretched condition,

a cover for wrapping said web, when said web is not being used by being stretched over the opening to be shielded,

said cover being secured at a section of said side wall beyond the opening,

said web fastened releasably in stretched condition and stretched at least partially over the area of said cover on said side wall and over the opening to be shielded,

said upper member fixed to said top wall being a drapery rod which is extended beyond the opening over the position of said cover,

upper fastening means engaged with said web to slidingly connect said web to said drapery rod,

lower fastening means to connect said web to said lower wall fasteners,

said upper fastening means being sliding hooks engaging in holes formed in said web,

other fastening means to hold said cover to said side wall and also to releasably fasten said web to said side wall when said web is in a stretched condition,

said web, when in unstretched and folded condition, being suspended from drapery rod by said upper fastening means while said lower fastening means are set free from connection with said lower wall, said cover wrapping said web in said unstretched condition.

4,557,312

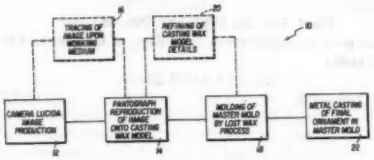
PROCESS OF FABRICATING METAL ORNAMENTS

Ervey C. Gonzales, 6222 NW. Loop 14, Apt. 2B, San Antonio, Tex. 78238

Continuation of Ser. No. 134,562, Mar. 27, 1980, abandoned, which is a continuation of Ser. No. 924,813, Jul. 14, 1978, abandoned. This application Oct. 19, 1984, Ser. No. 662,540

Int. Cl.⁴ B22C *9/02*

U.S. Cl. 164—34 **3 Claims**


TRACING OF IMAGE UPON WORKING MEDIUM
REFINING OF CASTING WAX MODEL DETAILS
CAMERA LUCIDA IMAGE PRODUCTION
PANTOGRAPH REPRODUCTION OF IMAGE ONTO CASTING WAX MODEL
MOLDING OF MASTER MOLD BY LOST WAX PROCESS
METAL CASTING OF FINAL ORNAMENT IN MASTER MOLD

1. In a process for the fabrication of metal ornaments having a design of a subject or object depicted thereon, the steps consisting of:

(a) using a camera lucida to project an image onto a first medium used for drawing and tracing said image onto said first medium so as to set forth all design details of said subject or object;

(b) using a pantograph to reproduce said image from the first medium directly onto a casting wax medium;

(c) refining the details of the design on said wax medium;

(d) forming a master mold by lost wax techniques; and

(e) casting metal ornaments within said master mold so as to have said image of said subject or object depicted upon said ornaments.

4,557,313

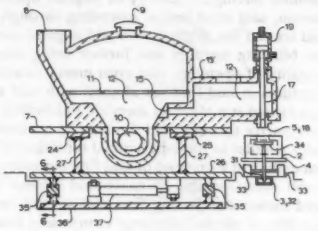
CONTINUOUS SEQUENTIAL CASTING APPARATUS

Robert L. Navarre, 23800 W. Fairway Dr., Woodhaven, Mich. 48183

Continuation of Ser. No. 918,717, Jun. 26, 1978, abandoned. This application Feb. 19, 1980, Ser. No. 122,600

Int. Cl.⁴ B22D *5/04, 39/00, 41/04*

U.S. Cl. 164—155 **10 Claims**



1. An apparatus for the continuous sequential casting of metals wherein a mold is advanced to a position directly under an outlet of a rotating furnace and then synchronized to move in arcuate motion with the outlet during the filling of the mold comprising: a furnace mounted for rotation about a vertical axis and having at least one outlet for discharging metal therefrom, said outlet moving in an arcuate path during the discharge of metal therefrom and a closure means for opening and closing said outlet; an underlying platform structure for supporting the furnace, said structure having a pair of plates spaced apart by vertical members and journal connected to the furnace at a location opposite the discharge outlet whereby said structure rotates in unison with the furnace during the discharge therefrom and said journal connection provides a horizontal axis opposite said outlet for back-tilting said furnace to prevent leakage from a defective outlet or allow service thereof, a foundation structure underlying said platform structure upon which the furnace and platform structure are mounted for rotation about said vertical axis and a bearing means interposed between said platform and foundation structures; a means for rotating the furnace about said vertical axis; a means for back-tilting said furnace about said horizontal axis; a series of molds for receiving metal from said furnace; a means for transporting said molds consecutively to and from said furnace, such that, when a mold is advanced to a position directly under said outlet, said mold moves in an arcuate path directly under said outlet; and a means for controlling the operation of said furnace whereby the motion and discharge of the outlet are synchronized with the motion of the mold.

4,557,314

CENTRIFUGE WITH COUNTER-BALANCE SCALE

John Dulski, Staten Island, and John Klobas, Garden City, both of N.Y., assignors to Buffalo Dental Mfg., Co., Inc., Syosset, N.Y.

Filed Apr. 6, 1984, Ser. No. 597,299

Int. Cl.⁴ B22D *13/00*

U.S. Cl. 164—287 **9 Claims**

1. A centrifuge comprising:

a base;

an articulated arm supported upon said base for rotation thereabout;

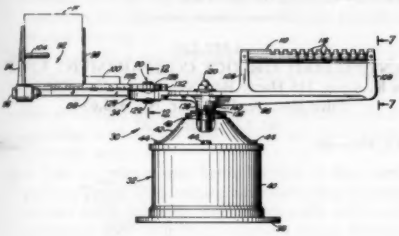
a motor disposed within said base and coupled to said arm for rotating said arm about an axis;

counterweight means disposed at one end of said arm for applying a counter-balancing amount of centrifugal force upon rotation of said arm;

means for supporting a flask of predetermined dimensions disposed on an opposite end of said arm and articulated relative to said counterweight means, the articulation of

said arm providing for a pivoting of said flask support means about an axis parallel to said axis of rotation;

said arm including means for limiting the amount of said pivoting; and wherein



said counterweight means includes means for anchoring a counterweight at any one of a set of predetermined positions, each said positions providing indicia being pre-calculated to relate to the dimensions of the flask to be supported.

4,557,315

ADJUSTABLE CONTINUOUS CASTING MOLD ARRANGEMENT

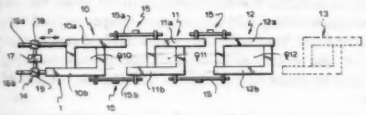
Gert Vaubel, Warburg-Welda, and Heinz Beier, Paderborn-Schloss Neuhaus, both of Fed. Rep. of Germany, assignors to Benteler-Werke Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 14, 1984, Ser. No. 620,552

Claims priority, application Fed. Rep. of Germany, Oct. 1, 1983, 3335762

Int. Cl.[4] B22D *11/00, 11/04*

U.S. Cl. 164—420 **18 Claims**



1. A continuous casting mold arrangement for multiple continuous casting installations for producing casting strands of a substantially rectangular cross-section, comprising a plurality of continuous casting molds each having at least two mold parts which are displaceable relative to one another for strand cross-section change in a displacement direction substantially transverse to a strand direction, said continuous casting molds being arranged one behind the other in said displacement direction, and the respective mold parts of each two neighboring ones of said continuous casting molds being connected with one another.

4,557,316

METHOD FOR MANUFACTURE OF INVESTMENT SHELL MOLD SUITABLE FOR CASTING GRAIN-ORIENTED SUPER ALLOY

Takeshi Takayanagi, Yatomimachi; Shizuo Suzuki; Susumu Minowa, both of Nagoya, and Yoshihiko Nozaki, Seto, all of Japan, assignors to Agency of Industrial Science & Technology and Ministry of International Trade & Industry, both of Tokyo, Japan

Filed Jun. 29, 1984, Ser. No. 625,895

Int. Cl.[4] B22C *1/04*

U.S. Cl. 164—517 **3 Claims**

1. A method for the manufacture of an investment shell mold by the steps of applying to the surface of a pattern of a soluble or inflammable substance slurries containing refractory substances thereby forming a coating of said slurries on the pattern, causing said coating to set and, after said coating has set, removing said pattern, which method is characterized by forming said coating by first applying to the surface of said pattern at least one layer of a slurry obtained by dissolving in an organic solvent solution of an organic soluble cellulose derivative the powder of the oxide of at least one element selected from the group consisting of magnesium, aluminum, zirconium, hafnium, yttrium, calcium, lanthanum, cesium, barium, and silicon and subsequently applying to said first layer at least one layer of a slurry formed by mixing a refractory powder and a refractory binder.

4,557,317

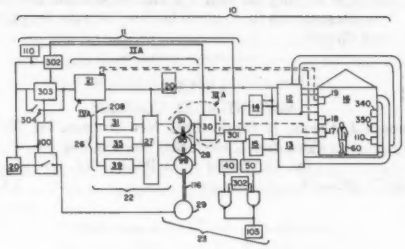
TEMPERATURE CONTROL SYSTEMS WITH PROGRAMMED DEAD-BAND RAMP AND DRIFT FEATURES

Kermit S. Harmon, Jr., 9449 Briar Forrest #5111, Houston, Tex. 77063

Continuation-in-part of Ser. No. 236,177, Feb. 20, 1981, abandoned. This application Oct. 5, 1983, Ser. No. 539,371

Int. Cl.[4] F25B *13/00;* **F23N** *5/20*

U.S. Cl. 165—2 **53 Claims**



12. A system for temperature control of an inhabited space including heating means, cooling means, fan means, temperature sensing means operatively connected to said space, and control means operatively connected to said heating means, said cooling means, said fan means, and said temperature sensing means, said control means comprising:

temperature setting means for setting temperature variation limits at which one of said heating and cooling means is activated and deactivated,

time setting means for setting a time period during which one of said heating and cooling means is automatically activated for maintaining temperature within said space within said variation limits;

limit change means for automatically changing said variation limits at which one of said heating and cooling means is activated and deactivated, said changing of said variation limits being in an energy conserving direction and said changing being at a rate of no more than approximately 1 deg. F. per hour; and

control means controlling said upper and lower limits in response to the length of time since said temperature setting means is actuated.

4,557,318

MEANS FOR LIFTING HEATING ELEMENT BASKETS

Kenneth O. Bellows, Wellsville, N.Y., assignor to The Air Preheater Company, Inc., Wellsville, N.Y.

Division of Ser. No. 557,034, Dec. 1, 1983, Pat. No. 4,552,204. This application Apr. 16, 1985, Ser. No. 723,972

Int. Cl.[4] F28D *19/04*

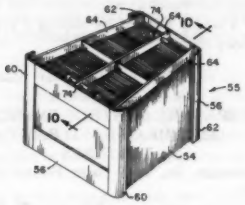
U.S. Cl. 165—10 **1 Claim**

1. A basketed heating element for use in a rotary regenerative heat exchanger comprising:

an open ended housing defining a volume;

a plurality of heating element plates disposed in spaced relation within the volume defined by the open ended housing;

an element holding bar extending transversely across each open end of the housing so as to divide each open end of the housing symmetrically thereabout and to retain the heating element plates therein; and



two pins integral with the element holding bar for lifting the basketed heating element, the first pin integral with the element holding bar near one end thereof and the second pin integral with the element holding bar near the opposite end thereof.

4,557,319

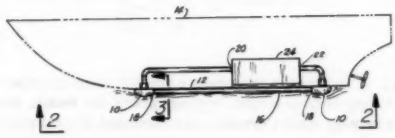
MARINE KEEL COOLER

Alanson J. Arnold, 16 Bluebird St., New Orleans, La. 70124

Filed Jul. 2, 1982, Ser. No. 394,943

Int. Cl.[4] B60H *3/00*; B63B *1/34*

U.S. Cl. 165—44 **1 Claim**



1. A marine keel cooler for cooling an operationally heated coolant of a marine vessel cooling jacket, having oppositely disposed cool input and hot output ends, comprising:

(a) a pair of parallel header means mounted transversely with respect to the keel and longitudinally spaced apart fore and aft on the exterior surface of the marine vessel bottom, and respectively connected through said bottom to said cool input and hot output ends of said cooling jacket, each of said header means having fore and aft edges adjacent said marine vessel bottom and a downwardly curved outer surface between said edges, for producing, as said vessel moves through the sea water in which it floats, a smooth laminar flow of said sea water over the outer surface of said header means; and

(b) a plurality of straight parallel coolant tube means spaced transversely apart from one another and from said vessel bottom having oppositely disposed ends, each of said tube means having upper rounded and lower rounded parallel sides and substantially planar parallel elongated right and left sides, defining a tube cross-section of a generally elongated oval shape, said oppositely disposed ends of said tube means being connected between said pair of header means to define a closed path for heated coolant through said tubes means, header means and said cooling jacket, said upper rounded and lower rounded parallel sides of adjacent tube means eliminating areas of vena contracta between said spaced apart tube means and said elongated right and left sides of adjacent tube means defining therebetween a channel through which sea water flows with increased velocity by the venturi effect for effecting maximum heat transfer from said operationally heated coolant circulated through said header and tube means, and said curved outer surface of said forward header means acting to direct sea water upwardly and obliquely through said channels between said tube means as the vessel moves forward through the sea water.

4,557,320

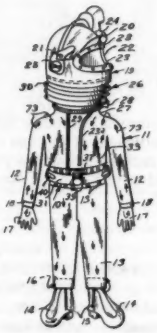
CENTRALIZED AIRLOCK COMPARTMENT UNIT

Norris K. Allen, 215 Hasty Rd., NE., Rome, Ga. 30161

Filed Dec. 30, 1982, Ser. No. 433,693

Int. Cl.[4] B60H *1/00*

U.S. Cl. 165—46 **2 Claims**



1. A centralized airlock compartment, comprising:

a suit comprising a leg portion and an upper body portion;

means for circulating fluid through said leg portion and said upper body portion, said circulating means including a rigid, detachable manifold adapted to fit about the waist of a person wearing said suit so as to disperse fluid into and receive fluid from said suit, said manifold being provided within said suit so as to support said person wearing said suit and to assist said person in bearing the weight of said suit;

a blower in communication with said manifold and operative for flowing fluid into said suit;

a damper disposed between said blower and said manifold and operative for regulating the flow of fluid into said suit;

an air cooler received on said suit, said air cooler being in communication with said blower and said manifold; and

a heater received on said suit, said heater being in communication with said blower and said manifold,

whereby air may be blown through said air cooler or said heater by said blower and into said manifold, and circulated through said suit so as to thermally insulate said person from a hostile temperature environment.

4,557,321

VENTILATOR APPARATUS

Julius M. von Resch, Stuttgart, Fed. Rep. of Germany, assignor to Gretsch-Unitas GmbH, Fed. Rep. of Germany

Filed Jan. 20, 1984, Ser. No. 572,577

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1983, 8301708[U]

Int. Cl.[4] F24H *3/06*; F24F *7/00*

U.S. Cl. 165—122 **14 Claims**

1. A ventilator assembly, comprising:

a generally elongated ventilator housing formed as a parallelepiped having a first and a second end with a front wall thereon formed as a flap cover and with a rear wall;

air inlet openings provided in said front wall at one of said first and said second ends and in said rear wall at one of said first and said second ends;

air outlet openings provided in said front wall at the other of

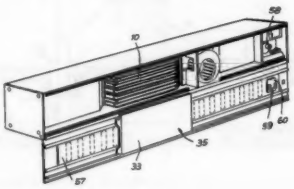
said first and said second ends and in said rear wall at the other of said first and said second ends;

a heat exchanger unit removably mounted within said housing between said first and second ends, said heat exchanger unit having one end facing said first end of said ventilator housing and another end facing said second end of said housing;

means defining a primary airstream between said air inlet openings in said rear wall and said air outlet openings in said front wall;

means defining a secondary airstream between said air inlet openings in said front wall and said air outlet openings in said rear wall;

said heat exchanger unit being located to have both said primary and said secondary airstreams flow therethrough in heat exchange relationship with each other, said heat exchanger unit comprising separator means dividing each of said primary and said secondary airstreams into numerous smaller partial airstreams, said separator means comprising separator members made of material having high thermal conductivity, each separating a smaller partial primary airstream from a smaller partial secondary airstream;



said one end of said heat exchange unit and said another end of said heat exchanger unit each being formed with inlet openings and outlet openings for both said primary and secondary partial airstreams, with each of said ends of said heat exchanger unit being defined by a pair of walls extending relative to each other at an angle not greater than 90°;

said inlet and outlet openings in said ends of said heat exchanger unit for said primary partial airstreams being arranged in planes approximately parallel to each other and said inlet and outlet openings for said secondary partial airstreams being also arranged in planes approximately parallel to each other;

each of said ends of said heat exchanger unit being formed by an angular distributor piece, said separator members comprising plates arraged to extend between said angular distributor pieces, each of said plates being formed with triangular ends opposite each other, with said distributor pieces including angular legs each of which comprise air passage slits forming said inlet and outlet openings with a number of said slits being approximately the same as the number of said plates; and

primary and secondary air blower means for blowing said primary and secondary airstreams, respectively, through said flow paths.

4,557,322

HEAT EXCHANGER CLOSURE SYSTEM

Stephen B. Nipple, Indianapolis, Ind., assignor to Kennedy Tank & Manufacturing Company, Inc., Indianapolis, Ind.

Filed Jul. 9, 1984, Ser. No. 629,199
Int. Cl.[4] F28F *9/02*
U.S. Cl. 165—158 **20 Claims**

1. A heat exchanger comprising

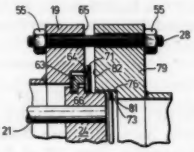
an outer shell, said outer shall having a terminal member at one end thereof;

at least one tube positioned within said shell;

means for supporting said at least one tube within said shell adjacent said terminal member;

a retaining ring means for securing said support means and said at least one tube supported thereby against longitudinal movement relative to said terminal member; and

means for preventing fluid leakage between said support means and said terminal member; said leakage-preventing means including



a first annular sealing surface, said first annular sealing surface comprising a first annular sealing surface portion on said terminal member, a second annular sealing surface portion on said retaining ring means, and a third annular sealing surface portion on said support means; and

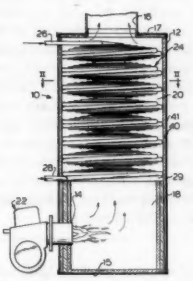
first annular sealing means positioned in sealing contact with each of said first, second, and third annular sealing surface portions of said first annular sealing surface.

4,557,323

HEAT EXCHANGER AND METHOD OF MAKING SAME

Brian E. Hardy, Burbank, and Harold D. Sealey, Vermillion, both of S. Dak., assignors to Electro-Magic, Inc., Vermillion, S. Dak.

Filed Aug. 4, 1983, Ser. No. 520,460
Int. Cl.[4] F28D *7/04;* **F22B** *5/02, 37/10*
U.S. Cl. 165—163 **5 Claims**



1. A heat exchanging device comprising:

a generally cylindrical housing disposed vertically with an inlet at a bottom end and an outlet at a top end;

a source of heated medium in communication with said housing inlet to introduce said heated medium into said housing;

a coil for carrying a liquid to be heated fabricated of a heat transfering material having at least one series of alternating conical helical winds positioned within said housing between said housing outlet and a coil outlet extending through said housing near said housing inlet and said housing outlet and having a coil inlet extending through said housing near said housing inlet;

said heated medium flowing upwardly through said housing from said housing inlet to said housing outlet over said coil;

said liquid to be heated flowing downwardly through said coil;

said coil having a continuous downward slope throughout its length of sufficient grade to permit said liquid to be urged toward said coil outlet by gravity;

a substantially horizontal baffle plate secured to an inner diameter of said conical helical winds to cause the heated medium to flow past said winds of said coil; and

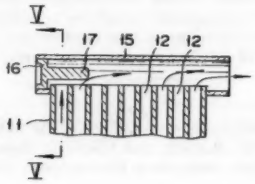
means including reinforcing members extending radially outward and upward secured to the underside of said winds to maintain said winds at said continuous downward slope and at a desired lateral spacing; whereby heat energy in said heated medium is transfered to said medium to be heated during a counter flow of said two mediums in said housing.

4,557,324

SERPENTINE TYPE EVAPORATOR

Hiroshi Kondo, Sano; Hiroyasu Nadamoto, Mitaka, and Yoshikazu Takamatsu, Sano, all of Japan, assignors to Nihon Radiator Co., Ltd., Tokyo, Japan

Filed Aug. 6, 1983, Ser. No. 637,793
Claims priority, application Japan, Aug. 8, 1983, 58-122188
Int. Cl.⁴ F28F *9/02*
U.S. Cl. 165—174 **7 Claims**



1. In a serpentine type evaporator comprising a serpentine tube provided therein with a plurality of coolant conduits and corrugated in a zigzag pattern, fins interposed between opposed outer surfaces of said serpentine tube, an inlet side header pipe connected to one end of said serpentine tube so as to communicate with said coolant conduits, and an outlet side header pipe connected to the other end of said serpentine tube so as to communicate with said coolant conduits, said outlet side header pipe being essentially normal to said serpentine tube and having one end closed, whereby the coolant discharged from said serpentine tube is directed laterally away from said closed end, the improvement which comprises;

means disposed within the outlet side header pipe which prevents the formation of a standing current in the neighborhood of the closed end.

4,557,325

REMOTE CONTROL FRACTURE VALVE

Adam F. Gall, Charleston, W. Va., assignor to McJunkin Corporation, Charleston, W. Va.

Filed Feb. 23, 1984, Ser. No. 583,036
Int. Cl.⁴ E21B *34/02*
U.S. Cl. 166—97 **2 Claims**

1. In combination:

a petroleum well including a bore hole at least partially cased by a casing which is perforated at a level corresponding to a petroleum-bearing formation which is intersected by said bore hole;

the casing being sealingly-surmounted by a wellhead which includes a fracture valve, said fracture valve having

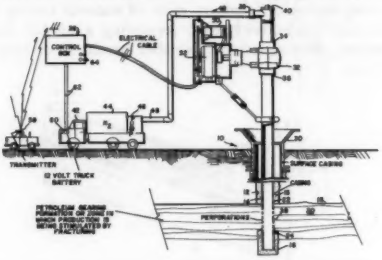
at least one port means constructed and arranged to be alternatively communicated to a source of pressurized fracturing fluid and the atmosphere,

another port means constructed and arranged to be communicated to said casing and thus to said petroleum-bearing formation, and

a valve member actuable to a first position to open the fractive valve in such a sense as to communicate. said casing through said fracture valve with only one of said source of pressurized fracturing fluid and the atmosphere, and to a second position to close the fracture valve in such a sense as to isolate said casing from both said source of pressurized fracturing fluid and the atmosphere;

an electrically-powered, reversible actuator operatively connected with the fracture valve;

a trasmitter unit/receiver unit remote control set of the garage door opener/closer type, this set having the receiver unit operatively connected with said electrically-powered reversible actuator for powering the actuator in one sense to move the valve member towards and to said first position upon receiving a first form of signal from said transmitter unit, and for alternatively powering the actuator in another sense to move the valve member towards and to said second position upon receiving a second form of signal from said transmitter unit;



said transmitter unit being constructed and arranged to send a signal of the first form through the air to said receiver unit upon being manually correspondingly actuated remotely from the receiver unit and to send a signal of the second form through the air to said receiver unit upon being manually correspondingly actuated remotely from the receiver unit;

said electrically power reversible actuator including a reversible D.C. motor, a speed reducer means constructed and arranged for operatively connecting said motor with said fracture valve, a switch means operatively connected with said D.C. motor for alternatively powering said D.C. motor in one angular sense, powering said D.C. motor in an opposite angular sense, and interrupting power to said D.C. motor; and a source of D.C. electrical power connected in circuit with said switch and said motor,

said source of D.C. electrical power being an electrical power take off on an on-site truck.

4,557,326

WELL TOOL LOCKING APPARATUS

Edward L. Bogard, Houston, Tex., assignor to Geosource Inc., Houston, Tex.

Continuation of Ser. No. 576,410, Feb. 2, 1984, abandoned. This application Jan. 10, 1985, Ser. No. 690,171
Int. Cl.⁴ E21B *23/00*
U.S. Cl. 166—212 **10 Claims**

1. Clamping apparatus for use in a conduit comprising:

a hollow body member;

a first piston movably fitted within said hollow body member to form a chamber,

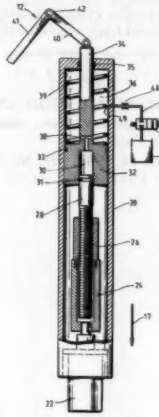
said chamber being filled with a working fluid;

said first piston having a bore formed therein opening away from said chamber and filled with said working fluid; and

said first piston having a passage formed therein to permit fluid communication between said bore and said chamber;

a reversibly extendable clamping arm connected to said first piston so that motion of said first piston in a direction that expands said chamber urges said clamping arm away from said clamping apparatus;

a bias member engaging said first piston and configured to expand said chamber;



a second piston movably fitted within said bore in said first piston;

a driver configured to reciprocate said second piston;

an inflatable reservoir member in fluid communication with said chamber; and

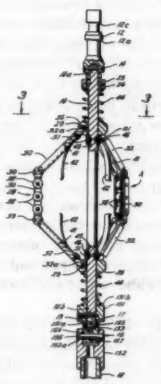
a valving assembly operable to regulate fluid communication between said reservoir and said chamber.

4,557,327

ROLLER ARM CENTRALIZER

Karl S. Kinley, Houston, and Allyn R. Pratt, Sugarland, both of Tex., assignors to J. C. Kinley Company, Houston, Tex.

Filed Sep. 12, 1983, Ser. No. 531,228
Int. Cl.[4] E21B *17/10*
U.S. Cl. 166—241 **8 Claims**



8. A device for centering a tool in a well pipe comprising:

an elongated body having ends adapted to allow said body to be mounted for running a tool in a well pipe;

a plurality of centering arms, each comprising an intermediate roller bar segment with rollers thereon adapted to engage the well pipe, and a pair of connector segments;

pivot means for pivotally interconnecting each roller bar segment with the pair of connector segments adjacent thereto;

stop means for limiting the relative movement of said roller bar segments and the corresponding pair of connector segments inwardly beyond substantially parallel alignment with said elongated body;

first biasing means comprising at least one spring exerting an axial force on said centering arms to urge them outwardly into engagement with the wall of the well pipe; and

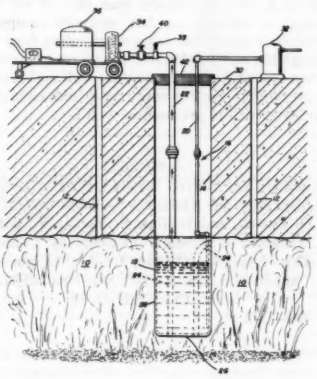
a plurality of second biasing means carried by said connector segments for engagement with said elongated body as said connector segments approach said elongated body for biasing said connector segments away from alignment therewith.

4,557,328

METHOD FOR UNDERGROUND BURNING OF COAL FOR ENERGY

Charles H. Birch, 836 W. Shamokin St., Trevorton, Pa. 17881

Filed May 3, 1984, Ser. No. 606,632
Int. Cl.[4] E21B *43/243*
U.S. Cl. 166—256 **6 Claims**



1. A method for recovering the heat from in situ burning of coal formations as a source of energy comprising;

a. providing at least one air hole as a source of directed air to aid in burning the coal formation;

b. drilling a hole for lowering a water to steam generating system into the burning coal formation;

c. lowering a water to steam generating system into the burning coal formation, where the drilled hole has been positioned to receive the greatest amount of heat;

d. circulating water into the water to steam generating system and removing steam as a source of energy;

e. said source of directed air directing the heat from the burning formation towards said drilled hole for the greatest heat concentration;

f. capping said drilled hole to prevent gases from escaping at the surface; and

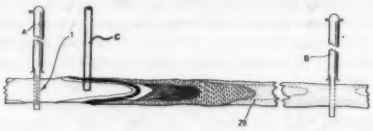
g. providing said water to steam generating system with an inlet water line and outlet steam line that is sealed to prevent any communication with the gases in the burning formation.

4,557,329

OIL RECOVERY BY IN-SITU COMBUSTION

Guy Savard, Westmount, and Robert G. H. Lee, Montreal, both of Canada, assignors to Canadian Liquid Air Ltd./Air Liquide Canada LTEE, Montreal, Canada

Filed Sep. 14, 1982, Ser. No. 417,996
Claims priority, application Canada, Sep. 18, 1981, 386166
Int. Cl.[4] E21B *43/243*
U.S. Cl. 166—261 16 Claims



1. In an in-situ forward combustion method for the recovery of oil from a subterranean sedimentary formation constituting an oil reservoir, in which air is injected through an injection well extending from the surface through the overburden into the oil reservoir at an injection zone under conditions to create a flame front moving away from the injection well to burn a portion of said oil and to cause fluids including oil to flow forward through a treatment zone towards at least one production well equipped for withdrawing oil and gases spaced from the injection well, the improvement in which,

air is introduced into the treatment zone through the injection well to advance the flame front to a certain point, then the injection of air is discontinued, and

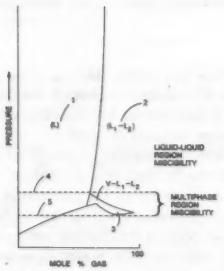
molecular oxygen is introduced directly into the treatment zone at a velocity greater than that of the flame front through a separate conduit specially equipped for the injection of molecular oxygen extending from the surface through the overburden into the oil reservoir in proximity to, but spaced from the injection well and between it and the production well to continue the advance of the flame front towards the production well.

4,557,330

MISCIBLE FLOODING WITH DISPLACING FLUID CONTAINING ADDITIVE COMPOSITIONS

Delbert D. Fussell, and William F. Yellig, Jr., both of Tulsa, Okla., assignors to Standard Oil Company, Chicago, Ill.

Continuation of Ser. No. 511,041, Jul. 5, 1983, abandoned. This application Jun. 3, 1985, Ser. No. 740,313
Int. Cl.[4] E21B *43/22*
U.S. Cl. 166—274 8 Claims



1. A method for the displacement of hydrocarbons through a liquid hydrocarbon-bearing subterranean reservoir having a temperature and pressure such that a mixture of the liquid hydrocarbon and CO_2 or enriched gas primary fluid does not form a multiphase region at said temperature and pressure and being penetrated by at least one injection well to displace hydrocarbons comprising:

injecting into the reservoir through the at least one injection well a displacing fluid comprising said primary fluid and at least one additive in an amount sufficient that a mixture of the liquid hydrocarbon and displacing fluid form a multiphase region at the temperature and pressure of the reservoir;

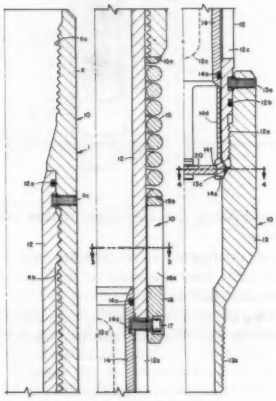
and displacing the displacing fluid through the reservoir, thereby forming a mixture of the liquid hydrocarbon and displacing fluid in the reservoir having multiple phases and displacing liquid hydrocarbons through the reservoir.

4,557,331

WELL PERFORATING METHOD AND APPARATUS

Gregg W. Stout, Montgomery, Tex., assignor to Baker Oil Tools, Inc., Orange, Calif.

Filed Nov. 14, 1983, Ser. No. 551,764
Int. Cl.[4] E21B *34/08, 34/14, 43/11*
U.S. Cl. 166—297 20 Claims



1. Well perforating apparatus comprising a tubular housing having means on its upper end for connecting to a tubular tool string; means on the lower end of said tubular housing for communicating to a perforating gun housing containing an impact actuated firing head; port means in said tubular housing; shiftable valve means for opening and closing said port means; means for biasing said shiftable valve means to a port opening position; means for securing said shiftable valve means in a port closing position; and restraining means resisting movement of said securing means from said port closing position; said restraining means being disposed in the free fall path of a detonating means transmitted through the tubular tool string and removed thereby, whereby the detonating bar initiates the opening of said radial port means prior to impacting said firing head.

18. The method of underbalance perforating a well casing and adjacent formation by a tubing string communicable, impact fired, perforating gun, said tubing string having an axially shiftable valve adapted to open and close radial ports in said tubing immediately above said perforating gun comprising the steps of:

securing said axially shiftable valve in said port closing position by a shiftable latch mechanism;

maintaining the fluid pressure in the tubing string adjacent the radial ports at a level below the anticipated formation fluid pressure;

dropping a detonating bar through the tubing to shift said latch mechanism out of engagement with said axially shiftable valve; and

moving said axially shiftable valve to its port opening posi-

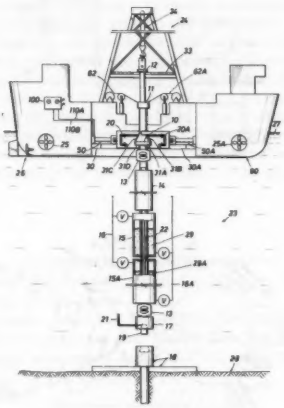
tion by energy supplied from a source other than the detonating bar.

4,557,332

DRILLING RISER LOCKING APPARATUS AND METHOD

Early B. Denison, Houston, and Jean-Claude M. Picard, Victoria, both of Tex., assignors to Shell Offshore Inc., Houston, Tex.

Filed Apr. 9, 1984, Ser. No. 597,995
Int. Cl.[4] E21B 7/128
U.S. Cl. 166—345 **35 Claims**



1. For use in a floating vessel having a substantially centrally-positioned vertical hull opening therethrough, and said vessel being provided with well drilling equipment, including an elongated vertical riser provided with riser stop means carried outwardly near upper end thereof, flexible coupling means in said riser below the stop means thereof and buoyancy adjusting means on the submerged portion of said riser, said riser extending in tension substantially centrally down through said hull opening to a point adjacent the ocean floor, and motion-compensating and tensioning means carried by said vessel operatively connected to said riser for vertically supporting said riser during normal operations,

said improvement comprising auxiliary riser locking means apparatus carried by said vessel substantially within the plan view cross section of the hull opening through the vessel, said locking means apparatus comprising:

at least two track means arranged in spaced relationship on opposite sides of and within said hull opening, and being connected to said vessel,

at least a pair of moveable locking beams supported at each end by each of said track means and positioned to span opposite portions of said hull opening, and being moveable towards each other,

vertical movement-limiting means engageable with said locking beams and operatively connected to said vessel adjacent said track means to prevent vertical movement of said moveable locking beams away from said track means,

at least one landing area carried by each of said moveable locking beams, said landing areas being engageable with at least a portion of said riser stop means,

at least a pair of riser-positioning means, each one being operatively connected between said riser and said vessel, and being moveable relative to each other and to the landing areas of said moveable locking beams to selectively position said riser within said hull opening of said vessel,

first prime mover means carried by said vessel and operatively connected to said pair cf riser positioning means for selectively moving said riser-positioning means,

second prime mover means carried by said vessel and operatively connected to said moveable locking beams for selectively moving said beams, and

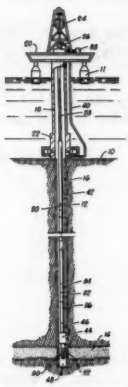
resilient means carried by said vessel and operatively connected to at least one of said prime mover means.

4,557,333

LOW PRESSURE RESPONSIVE DOWNHOLE TOOL WITH CAM ACTUATED RELIEF VALVE

Harold K. Beck, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Sep. 19, 1983, Ser. No. 533,834
Int. Cl.[4] E21B 34/10
U.S. Cl. 166—374 **20 Claims**



1. An annulus pressure responsive downhole tool apparatus, comprising:

a tool housing;

a power piston slidably disposed in said housing;

a first pressure conducting passage means for communicating a well annulus with a first side of said power piston;

a second pressure conducting passage means for communicating said well annulus with a second side of said power piston;

retarding means, disposed in said second pressure conducting passage means, for delaying communication of a sufficient portion of an increase in well annulus pressure to said second side of said power piston for a sufficient time to allow a pressure differential from said first side to said second side of said power piston to move said power piston from a first position to a second postion relative to said housing; and

pressure relief means, communicated with a first portion of said second pressure conducting passage means between said second side of said power piston and said retarding means, for relieving from said first portion of said second pressure conducting passage means a volume of fluid sufficient to permit said power piston to travel to its said second position, said pressure relief means including:

a fluid dump zone;

a fluid dump passage means for communicating said first portion of said second pressure conducting passage means with said fluid dump zone;

a fluid dump valve, disposed between said first portion of said second pressure conducting passage means and said fluid dump passage means, said dump valve being movable between a closed position isolating said first portion of said second pressure conducting passage means from

said fluid dump passage means and an open position wherein fluid is allowed to flow from said first portion of said second pressure conducting passage means to said fluid dump passage means; and

operating means operatively associated with said power piston and said fluid dump valve, for moving said fluid dump valve to its said open position as said power piston starts to move from its said first position toward its said second position, for holding said fluid dump valve in its said open position until said power piston reaches its said second position, and for returning said fluid dump valve to its said closed position after said power piston reaches its said second position.

4,557,334

HORSESHOE LINING

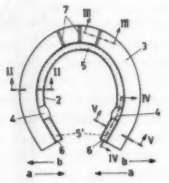
Giuseppe Cattaneo, Via Maistra 46, CH-7500 St. Moritz, Switzerland

Filed Aug. 13, 1984, Ser. No. 640,198

Claims priority, application Switzerland, Aug. 25, 1983, 4642/83

Int. Cl.⁴ A01L *7/02*

U.S. Cl. 168—12 **5 Claims**



1. A horseshoe lining of elastic material for positioning between the hoof and the horseshoe, comprising a horseshoe-shaped elastic insert body formed by a strip bent through a full circle, the inside edge of the strip in the horseshoe shape forming a tube and its outside edge forming, by interconnection of the sides of the strip, a securing lug, wherein said tube, in an intermediate part, has a closed air chamber resistant to counter-pressure and, at its ends air chambers less resistant to counter-pressure, in order to keep the shock absorbing action in walking more effective on the front part of the hoof but weaker on the rear part, and further, wherein said securing lug, in an intermediate part, has preliminary cuts which, after being completely cut, enable the width of the horseshoe-shaped insert body to be increased or reduced.

4,557,335

WING SECTION ROD WEEDER WITH MATING COUPLING COMPONENTS

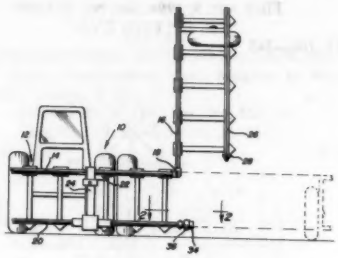
Barry L. Handy, Box 2520, Scobey, Mont. 59263

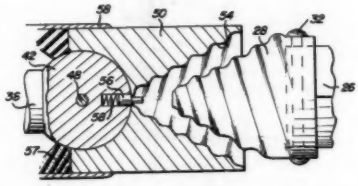
Filed Mar. 28, 1983, Ser. No. 47⁰,807

Int. Cl.⁴ A01B *39/19*

U.S. Cl. 172—44 **8 Claims**

6. In combination with a hinged wing section equipped implement of the type including a first stationary horizontally elongated section and a second horizontally elongated extension section, means pivotally connecting one end of said extension section to a first end of said stationary section as an extension thereof and for angular displacement of said extension section relative to said stationary section between a first horizontal extended position projecting outwardly from said first end and a second upstanding folded position projecting upwardly from said first end, a first reversible motor driven rod weeder shaft journalled from said stationary section below the latter, an extension rod weeder shaft journalled from said extension section below the latter and aligned with the adjacent end of said first rod weeder shaft when said extension section is in said horizontal position, the adjacent ends of said shafts including mating tapered male and female coupling components, said mating tapered male and female components coacting to define coupling means operative to establish a supportive and driving coupling between said components upon projection of said male coupling component into said female coupling component and rotation of the coupling components supported from said first rod weeder shaft in one direction or rotation relative to the coupling component supported from said extension rod weeder shaft, and further operable to uncouple the coupling component carried by said first rod weeder shaft from the coupling component carried by said extension rod weeder shaft upon rotation of said first rod weeder shaft in the other direction against the inertia of said extension rod weeder shaft resisting rotation thereof in said other direction.





4,557,336

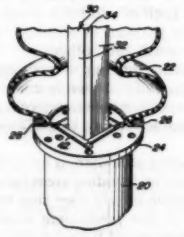
ALIGNMENT MECHANISM FOR RAM TYPE COMPACTORS

Richard A. DeNise, Hemlock, N.Y., assignor to Stone Construction Equipment, Inc., Honeoye, N.Y.

Filed Sep. 23, 1982, Ser. No. 425,044

Int. Cl.⁴ E01C *19/30*

U.S. Cl. 173—90 **2 Claims**



1. In a ram type compactor having an engine, gear case and handle assembly fixedly associated in relation to each other, a spring housing with spring means therein extending downwardly from a point below the gear case and a tamping shoe

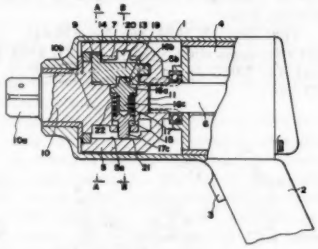
rigid with the lower end thereof, said spring housing being drivingly connected to the engine through the spring means for reciprocating the spring housing and tamping shoe, a flexible bellows-type boot interconnecting the gear case and the upper end of the spring housing to enable relative movement therebetween and enclose the space therebetween, a guide member connected with the gear case and extending from the gear case through the interior of the boot and downwardly into the spring housing, the upper end of the spring housing including a hole reciprocally receiving and guiding said guide member with the guide member guiding movement of the spring housing during reciprocal movement of the spring housing and tamping shoe, said tamping shoe including a major longitudinal dimension paralleling the major longitudinal dimension of the engine, gear case and handle assembly to enable an operator to directionally control the compactor, that improvement comprising said guide member and said hole being of corresponding polygonal cross-sectional configuration for preventing relative angular displacement of the spring housing about an axis extending longitudinally of the guide member thereby retaining the tamping shoe from angular displacement about the same axis without exerting torsional forces on the flexible boot and bearing means lining the internal surface of the hole and engaging the external surface of the guide member.

4,557,337

IMPACT WRENCH

Ryoichi Shibata, Habikinoshi, Japan, assignor to Katushiki Kiisha Kuken, Osaka, Japan

Continuation-in-part of Ser. No. 340,669, Jan. 19, 1982, Pat. No. 4,460,049. This application Jan. 5, 1984, Ser. No. 568,561
Claims priority, application Japan, Jan. 27, 1981, 56-11088
Int. Cl.[4] B25D *15/02*
U.S. Cl. 173—93.5 **6 Claims**



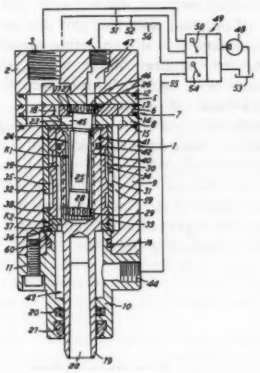
1. An impact wrench comprising:
a casing;
driving means situated in said casing,
a cylindrical rotor rotationally situated in said casing to be driven by said driving means, said rotor having an inner surface and engaging means situated on said inner surface of the rotor,
an anvil rotationally situated in said cylindrical rotor and having a groove thereon located inside the cylindrical rotor to extend parallel to the axis of the rotor,
a hammer pivotally disposed in the groove of the anvil and having a pair of side ridges, said hammer, when tilted relative to the anvil, allowing the rotor to freely rotate therealong and engaging the engaging means of the rotor when encountered, and
means for providing tension to the hammer only when the hammer substantially engages the engaging means, said means for providing tension being actuated to urge the hammer to orient radially outwardly from the axis of the rotor to thereby allow the hammer to disengage from the engaging means when rotation of the rotor stops, said means for providing tension including shallow and deep cam surfaces radially outwardly extending from the inner surface of the rotor around the circumference of the rotor in a plane perpendicular to the axis of the rotor, said shallow cam surface being substantially located opposite the engaging means on the rotor with respect to the axis of the rotor and said deep cam surface being located at the rest of circumference of the rotor in that particular plane, and a tension device situated in said anvil between the hammer and one of the shallow and deep cam surface, said tension device having a pusher situated behind the hammer, a support to be contacted by one of the shallow and deep cam surfaces, and a spring situated between the pusher and the support to urge them away from each other so that when the support is located on the shallow cam surface, the pusher is pushed toward the hammer to orient the hammer radially outwardly of the cylindrical rotor.

4,557,338

TOOL, PARTICULARLY A BORING TOOL

Johannes V. Baatrup, Sonderborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Filed Nov. 25, 1983, Ser. No. 555,041
Claims priority, application Fed. Rep. of Germany, Dec. 16, 1982, 3246548
Int. Cl.[4] B23B *45/16*
U.S. Cl. 173—134 **5 Claims**



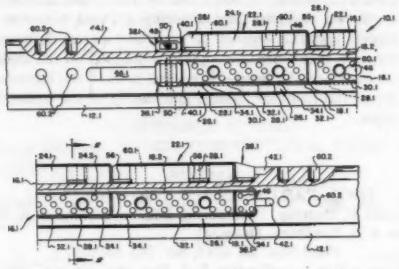
1. A boring tool, comprising, a housing, fluid pressure operated motor means connected to said housing having an internally toothed ring gear fixed relative to said housing and an externally toothed star gear having rotational and planetary movement relative to said ring gear, rotatable valving means in said housing, output shaft means having a splined bore and axially oppositely effective piston pressure area means to effect pressure biasing of said shaft means in axially opposite directions, one of said pressure area means being internally of said splined bore, said output shaft means being connected to said valving means for rotation therewith and axial movement relative thereto, carden shaft coupling means which accomodates said planetary movement of said star gear mounted between said star gear and said output shaft means splined bore, first fluid connection means and passage means in said housing for supplying and exhausting operating fluid to and from said valving means to effect rotational movement of said motor means and said output shaft means, first and second chamber means in said housing on opposite sides of said piston pressure faces, second fluid connection and passage means in said housing for supplying and exhausting fluid to and from said chambers to effect reciprocal axial movements of said output shaft means, said spline means having a length at least equal to the stroke of said axial movement.

4,557,339

BOREHOLE CONDITIONING APPARATUS

Charles L. Falknor; Vincent H. Vetter; Dale R. Wolfer, and Dalton K. Lyon, all of Houston, Tex., assignors to Hughes Tool Company, Houston, Tex.

Filed Dec. 30, 1982, Ser. No. 454,591
Int. Cl.⁴ E21B *17/10*
U.S. Cl. 175—325 **45 Claims**



1. A borehole conditioning tool suitable for use in a drill string, the tool comprising:

(a) a tubular body portion having a plurality of elongated, circumferentially spaced retainer slots for housing wall contacting members, each retainer slot being defined by a pair of opposed elongated slot side walls; and

(b) a plurality of wall contacting members in the form of elongated stabilizer blades which are mounted in the retainer slots, each stabilizer blade having a pair of opposed blade side walls;

the slot side walls and blade side walls being shaped so that for each stabilizer blade one blade side wall is in engagement with one slot side wall, while the opposed blade side wall is in engagement with the opposed slot side wall along only a portion of the length of the blade side wall in at least one interference zone, the degree of interference being sufficient to locate the blade in position in the slot.

4,557,340

METHOD OF COMBINATORIAL WEIGHING IN A COMBINATORIAL WEIGHING MACHINE

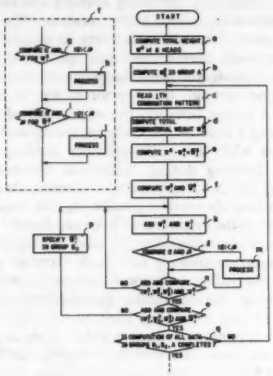
Masao Fukuda, Shiga, Japan, assignor to Kabushiki Kaisha Ishida Koki Seisakusho, Kyoto, Japan

Filed Oct. 12, 1984, Ser. No. 660,104
Claims priority, application Japan, Oct. 14, 1983, 58-191992
Int. Cl.⁴ G01G *19/00, 19/22*
U.S. Cl. 177—1 **6 Claims**

1. A method of combinatorial weighing in a combinatorial weighing apparatus including a plurality of weighing machines for weighing charged articles, and a combinatorial processor unit for computing combinations of weight values issued from the weighing machines and for determining an optimum weight combination equal to a target weight value or closest to the target weight value within an allowable preset range, the method comprising the steps of:

(a) providing two groups of patterns of combinations of the weight values;

(b) dividing one of the groups into two subgroups which are complements of each other; and



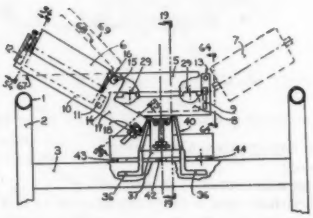
(c) successively processing the two groups of patterns independently and in combination to find the optimum weight combination.

4,557,341

BELT WEIGHING DEVICE WITH INDIVIDUALLY ADJUSTABLE REELS

Arne Söderholm, Bromma, Sweden, assignor to S.E.G. Resistor AB, Vallingby, Sweden

Filed May 15, 1984, Ser. No. 610,415
Claims priority, application Sweden, Jul. 21, 1983, 8304073
Int. Cl.⁴ G01G *11/14, 13/02;* B65G *39/12*
U.S. Cl. 177—16 **7 Claims**

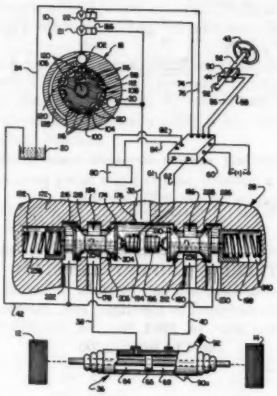


1. A weighing device for belt conveyors with three driving reels located each in an enclosing frame, of which reels at least the lateral ones are individually adjustable, characterized in that the frame of the central reel is attached to a load measuring device of such a design as to measure the reel stand load, that the frames of the lateral reels are provided with attachment means to the frame of the central reel, so that the lateral reels are rotary about axles in parallel with the longitudinal direction of the conveyor belt where the centres of rotation are located near to or in the intersection points of the upper reel shell generatices to the upper shell generatrix of the central reel, that the frames of the lateral reels are extended with arms directed substantially in the longitudinal direction of said frames inward to the centre of the reel stand, and that at these arm ends distance members adjustable as to their length are located which rest against the lower surface of the central reel frame.

4,557,342
HYDRAULIC APPARATUS

Gilbert H. Drutchas, Birmingham, Mich., assignor to TRW Inc., Cleveland, Ohio

Filed May 20, 1983, Ser. No. 496,619
Int. Cl.⁴ B62D *5/08*
U.S. Cl. 180—132 **14 Claims**



11. An apparatus for controlling the operation of a power steering motor having opposite chambers for receiving fluid to turn a steerable vehicle wheel in opposite directions, said apparatus comprising

a pump for supplying fluid under pressure,

a reservoir containing a supply of fluid for said pump,

a directional control valve assembly connected in fluid communication with said pump and operable to direct fluid from said pump to one of the chambers of the power steering motor depending on the direction of turning of the vehicle wheel,

a flow control valve operable to vary the flow of fluid from said pump to said directional control valve assembly for both directions of turning of the vehicle wheel, and

electrical control means for effecting actuation of said directional control valve assembly to effect operation of the power steering motor and for effecting actuation of said flow control valve to increase the fluid pressure conducted to said directional control valve assembly and power steering motor after actuation of said directional control valve assembly.

4,557,343
POWER STEERING CONTROL APPARATUS AND METHOD

William Pickering, University Heights, Ohio, assignor to Towmotor Corporation, Mentor, Ohio

Filed Aug. 8, 1984, Ser. No. 638,849
Int. Cl.⁴ B62D *5/04, 5/06*
U.S. Cl. 180—142 **4 Claims**

1. A power steering control apparatus for a vehicle, comprising:

steering means for controllably steering said vehicle;

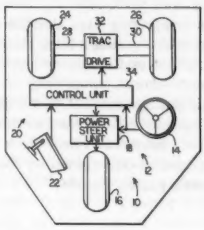
steering transducer means for producing a steering demand signal responsive to said steering means;

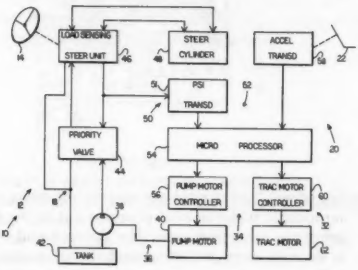
an accelerator member moveable to a plurality of positions;

accelerator transducer means for producing an speed demand signal in response to the position of said accelerator member;

speed control means for receiving said speed demand signal, producing a predetermined speed control signal in response to said received speed demand signal, and controllably propelling said vehicle at a speed responsive to said speed control signal;

processor means for receiving said steering demand signal and said speed control signal, producing a high flow rate signal in response to receiving said steering demand signal and to said produced speed control signal representing a vehicle speed less than or equal to a predetermined vehicle speed, producing a low flow rate signal in response to





receiving said steering demand signal and to said produced speed control signal representing a vehicle speed greater than said predetermined speed, and producing an idle flow rate signal in response to failing to receive said steering demand signal; and,

hydraulic means for receiving said high, low, and idle flow rate signals, producing respective predetermined hydraulic fluid flow rates in response to said received signal, and delivering said hydraulic fluid to said steering means.

4,557,344
SERVOSTEERING, ESPECIALLY FOR MOTOR VEHICLES

Armin Lang, Schwabisch Gmund, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen, AG., Friedrichshafen, Fed. Rep. of Germany

PCT No. PCT/EP83/00250, § 371 Date Aug. 23, 1984, § 102(e) Date Aug. 23, 1984, PCT Pub. No. WO84/02500, PCT Pub. Date Jul. 5, 1984
PCT Filed Sep. 28, 1983, Ser. No. 645,322
Claims priority, application Fed. Rep. of Germany, Dec. 28, 1982, 3248252
Int. Cl.⁴ B62D *5/08*
U.S. Cl. 180—143 **6 Claims**

1. In a motor vehicle steering system of the kind described for pressurizing and exhausting chambers of a double acting servomotor;

comprising a pair of piston valves **(2) (45, 46) (49, 50) (66, 67)** manually shiftable in bore means **(43, 53, 54)** in a housing **(3) (44)** and exposed to opposing pressures in respective reaction chambers **(24, 25)** and having coaction with said housing to provide inlet flow control gaps **(19, 20)** and

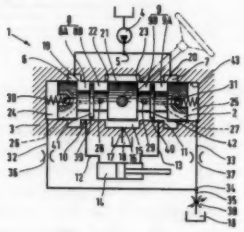
return flow control gaps (22, 23) for pressurizing and exhausting said servomotor chambers wherein said gaps are open in neutral position;

means (26, 28) (27, 29) providing flow passage from said servomotor chambers to respective reaction chambers through respective check valves (30, 31) wherein each servomotor chamber connects to said housing intermediate an inlet flow control gap and a return flow control gap;

means comprising fixed throttle means (36, 37) and a speed responsive variable flow throttle (38) effecting pressure control of said reaction chambers;

the improvement comprising:

throttle passage means (39, 40) (55, 56) (59, 60) in said housing operatively disposed to throttle flow from said servomotor chambers to respective reaction chambers (24, 25) at pressures determined by flow through said respective throttle passage means;



either of said flow control gap means comprising gaps predeterminedly wider in neutral position than the gaps of the other gap means whereby flow through said valve means is dependent on predetermined shifted positions of said valve means to initially cause equal or unequal opposed pressures in said reaction chambers responsive to closure or opening of said speed responsive throttle (38) and throttling of flow to respective reaction chambers by said throttle passage means;

wherein said servomotor is pressurized only subsequent to a further predetermined degree of shift of said valve means independently of an open or closed condition of said speed responsive throttle means;

whereby reaction chamber centering force on said piston valves is variable and dependent on vehicle speed, varying from low at low speeds to high at high speeds.

4,557,345

MOTORCYCLE ENGINE COOLING SYSTEM

Masumi Hamane, and Takanori Onda, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 9, 1983, Ser. No. 530,853

Claims priority, application Japan, Sep. 11, 1982, 57-158380; Sep. 11, 1982, 57-158381

Int. Cl.[4] B60K *11/04*

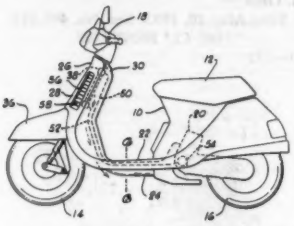
U.S. Cl. 180—229 **15 Claims**

1. A motorcycle comprising

a front leg shield having a hollow interior;

a step floor aft of said front leg shield;

a water-cooled engine aft of said step floor;



an engine cooling system for said water-cooled engine, including a radiator, said radiator being positioned in said hollow interior of said front leg shield.

4,557,346

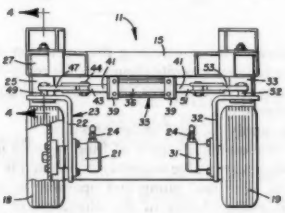
STEERING AND DRIVE SYSTEM

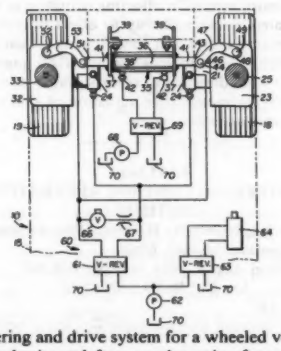
Paul C. Guignard, Concord, and Michael D. Ream, Lafayette, both of Calif., assignors to Up-Right, Inc., Berkeley, Calif.

Filed Mar. 16, 1984, Ser. No. 590,333

Int. Cl.[4] B62D *5/06*

U.S. Cl. 180—242 **5 Claims**





1. A steering and drive system for a wheeled vehicle having a generally horizontal frame and a pair of non-steering and non-driving wheels at one end of said frame, said steering and drive system comprising:

a pair of wheel brackets at the other end of said frame,

a hydraulic motor mounted on each wheel bracket,

a steering wheel on each wheel bracket and rotatably driven about a horizontal axis by the motor on that wheel bracket,

means for mounting said wheel brackets to said frame for pivoting of said wheel brackets about spaced apart verti-

cal axes, with the vertical axis of each wheel bracket passing through the horizontal axis of rotation of the wheel mounted thereon,

a double-ended hydraulic cylinder having a housing fixed to said frame at a horizontal level above said motors and a piston extending horizontally from each end of said housing,

a first link pivotally connected at one end thereof to one end of said piston and pivotally connected at the other end thereof to one of said wheel brackets at a location thereon horizontally offset from the vertical axis of that wheel bracket,

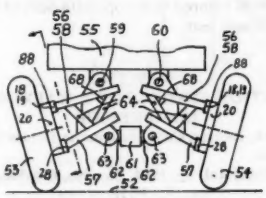
a second link pivotally connected at one end thereof to the other end of said piston and pivotally connectable at the other end thereof to the other of said wheel brackets at a location thereon horizontally offset from the vertical axis of that wheel bracket.

4,557,347

FLUID PUMPS, FLUID MOTORS AND DEVICES, WHEREIN THEY ARE APPLIED

Karl Eickmann, 2420 Isshiki, Hayama-machi, Kanagawa-ken, Japan

Filed Jul. 14, 1981, Ser. No. 282,990
Int. Cl.⁴ B60K *7/00*
U.S. Cl. 180—308 **2 Claims**



1. A device to drive a rotor of a fluid motor to revolve, to carry a body by said motor and said motor to be carried by said body respectively;

wherein said device consists of a fluid pump, a fluid line from said pump to said motor and a structure,

wherein said structure includes a pipe to form said fluid line,

wherein said motor includes said rotor revolvably borne in bearings in a housing, fluid ports on said housing and passages from said ports to working chambers which are provided in said rotor and revolve said rotor when fluid is pressed into and through said chambers,

wherein said structure consists of at least three pipes which are substantially parallel to each other and which are fastened to each other by ribs between said pipes while one of said pipes is placed laterally of the two other pipes of said structure,

wherein one of said pipes of said structure forms said fluid line to pass a pressurized fluid flow from said pump through said pipe to at least one port of said ports of said motor,

wherein the distances between the axes of said pipes of said structure are larger than the outer diameters of said pipes,

wherein said structure forms an inner end and an outer end with said inner end fastened at least indirectly to said body while said outer end forms a holding portion with said pipes and is provided with at least one plane face which is substantially perpendicular to said axes of said pipes while a bore extends through said holding portion to communicate said fluid line with said plane face and to port said fluid line to said plane face,

wherein said holding portion and said plane face form at least three holding places whereof one is laterally distanced from two others of said holding places,

wherein said fluid ports of said motor are extended in one single direction, are laterally distanced from each other and port into at least one plane housing face of said housing which is substantially perpendicular to the axes of said ports of said motor,

wherein said plane housing face includes at least three fastening places whereof one is laterally distanced from two others of said fastening places and two of said fastening places are provided in the neighborhood of ports of said motor, whereby said fastening places form the mirror image of said holding places of said plane face of said holder of said structure; and;

wherein said plane face of said holding portion of said structure is fastened to said plane housing face of said motor at said at least three fastening places,

whereby said fluid line to pass said pressurized fluid is communicated from said pump through said structure, one of said holding places and one of said fastening places directly to the respective port of said ports of said motor,

while said structure thereby fulfills the plurality of functions of forming a fluid line and of holding a motor and said motor fulfills the plurality of functions of revolving a member which is fastened to the shaft of the rotor of said motor and of carrying a load,

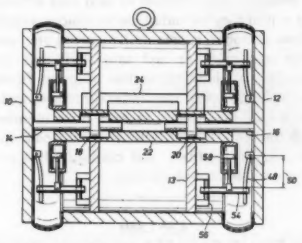
whereby said device respective to said body and remote of said body is able to drive and to carry a revolvable member on the shaft of said motor and thereby to carry said body and to drive the movement of said body.

4,557,348

TUNABLE MARINE SEISMIC SOURCE

Joseph F. Mifsud, Houston, Tex., assignor to Exxon Production Research Co., Houston, Tex.

Continuation-in-part of Ser. No. 235,202, Feb. 17, 1981. This application Nov. 24, 1982, Ser. No. 444,298
The portion of the term of this patent subsequent to Nov. 20, 2001, has been disclaimed.
Int. Cl.⁴ G01V *1/38*
U.S. Cl. 181—120 **15 Claims**



1. A device suitable for use as a marine seismic source comprising:

dual opposed acoustic radiators,

an actuator supported on a fixed support for oscillating each of said dual radiators to produce an acoustic signal in water having a frequency which changes with time, said actuators being mechanically connected to each said radiator,

at least one spring system comprising adjustable length cantilever spring means rotatably attached to each acoustic radiator and having a length adjustable by means of a cantilever support slidably attached to said fixed support, and

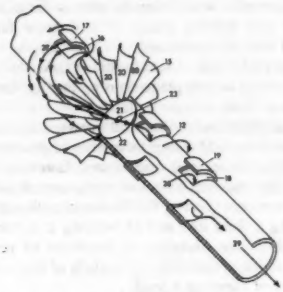
whereby the length of said cantilever spring means varies as a function of said frequency.

4,557,349

SOUND-MUFFLING SYSTEM

Herschel W. Crump, 117 Yuchi Trail North, Fort Worth, Tex. 76108

Filed Aug. 10, 1983, Ser. No. 521,680
Int. Cl.[4] F01N *1/12*
U.S. Cl. 181—279 **12 Claims**



1. A sound muffling device for use in the flow line of apparatus emitting pulsed gas flow, said muffling device comprising:

an outer tubular shell having closure members at each end thereof;

a tubular flow member extending concentrically through said shell and said closure members, and being securely fixed therein;

a baffle plate substantially closing said tubular flow member at a point about midway between said closure members;

a first set of flow ports in said flow member, passing through the wall thereof upstream of said baffle plate, and having radially projecting leaf members arranged to direct gas flow outward from said flow ports in a combined rotational/axial direction in the annular area between said flow member and said shell;

said flow ports being located in at least two different axial positions on said flow member upstream of said baffle plate;

a stator assembly downstream of said first flow ports comprising a plurality of radial stator blades extending from said flow member substantially across the annular area between said member and said shell and arranged to change the rotational direction of gases flowing thereacross to the opposite rotational direction; and,

a second set of flow ports in said flow member, passing through the wall thereof downstream of said stator blades and said baffle member, and configured in at least two different axial locations thereon.

4,557,350

FOLDING CHAIR CAPABLE OF CONVERTING INTO STEP LADDER

Jung-Hwa Wang, 2nd Fl., No. 54, Huan Ho East Rd., Sec. 3, Yung Ho City, Taipei Hsien, Taiwan

Filed Mar. 20, 1985, Ser. No. 713,898
Int. Cl.[4] A47C *13/00, 9/00, 3/18*
U.S. Cl. 182—33 **5 Claims**

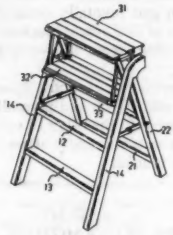
1. A folding chair capable of converting into a step ladder comprising:

a first frame part having the lower end portion thereof forwardly disposed comprising two front leg supports, a back rail connecting the upper ends of said front leg supports and transverse stretchers connecting the lower ends thereof;

a second frame part having the lower end portions thereof backwardly disposed comprising two rear leg supports having upper ends thereof each being pivotally connected to the inner side of the upper end of each said front leg support and a transverse stretcher connecting the lower ends of said front leg supports;

a seat formed of a front seat portion, a middle seat portion and a rear seat portion having one portion thereof imbricating the next in order;

two sets each including two parallel linkage means having



the opposite ends thereof pivotally connected to said front seat portion and middle seat portion respectively of said seat;

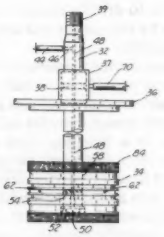
two crank arms having the front ends pivotally connected to the opposite sides of the front edge of said seat portion and the rear ends secured to the opposite sides of said rear seat portion of said seat.

4,557,351

LUBRICATION SYSTEM FOR A WALKING BEAM COMPRESSOR

Russell D. Volk, Denver, Colo., assignor to Denice C. Reich Inc., Denver, Colo.

Filed Jul. 25, 1984, Ser. No. 634,390
Int. Cl.[4] F01B *31/10*
U.S. Cl. 184—18 **6 Claims**



1. An improved lubrication system for lubricating and cooling a piston and inner cylinder wall of a walking beam compressor, the compressor mounted on a walking beam pump, the piston connected to a piston shaft which is raised and lowered by the movement of the walking beam of the walking beam pump, the shaft supported by a bearing housing having a bearing disposed around the piston shaft, the compressor used for compressing low pressure natural gas, the system comprising:

a pressure oil lubricator;

a first oil line connected to the lubricator;

a shaft inlet port in the side of the piston shaft, the inlet port connected to the first oil line;

an oil bore communicating with the shaft inlet port and extending along the length of the shaft;

a shaft outlet port disposed adjacent the interior of the piston;

a plurality of oil chambers radially disposed in the interior of the piston and communicating with the shaft outlet port;

a plurality of piston outlet ports in the sides of the piston and

communicating with the oil chambers for introducing oil between the side of the piston and the cylinder wall;

a second oil line connected to the lubricator and to a bearing housing inlet port in the side of the bearing housing;

a bearing inlet port communicating with the bearing housing inlet port, the bearing inlet port receiving oil from the second oil line and introducing the oil around the piston shaft; and

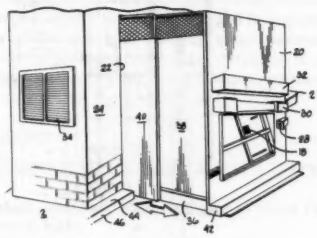
oil grooves along the side of the bearing and communicating with the bearing housing inlet port for introducing oil around the piston shaft inside the compressor.

4,557,352

APPARATUS AND METHOD FOR DRIVE-UP BANKING

Robert W. Tschappat, Jr., Englewood, Colo., assignor to United Banks of Colorado, Inc., Denver, Colo.

Filed Nov. 7, 1983, Ser. No. 549,064
Int. Cl.[4] E04H *1/12*
U.S. Cl. 186—37 **20 Claims**



1. Banking apparatus comprising:

a plurality of islands having a length, width and depth;

a driveway in front of each island so that one driveway is between adjacent islands;

an automatic teller machine located on each of said islands so that vehicles may be moved over each of said driveways and banking business may be conducted at each of said automatic teller machines, at least a first of said automatic teller machines having a first portion, said first portion being used in controlling operation of said first automatic teller machine, said first automatic teller machine also having a second portion operatively associated with said first portion;

a housing in which said first automatic teller machine is normally in a first closed position for conducting banking business, said housing including a front panel in which said first portion is positioned;

means for permitting movement of said first automatic teller machine from said first closed position to a second position, said second position being over said driveway in front of said first automatic teller machine; and

an entryway in said housing permitting access to said second portion of said first automatic teller machine, said entryway being located separate and away from said first portion of said automatic teller machine, said front panel remaining unopened while gaining access to said second portion when said first automatic teller machine is in said second position so that a mechanic may enter said housing to service said first automatic teller machine without blocking the driveway of an adjacent automatic teller machine.

19. In a method of conducting a drive-up banking system comprising a plurality of islands and a driveway in front of each island over which vehicles may pass, the improvement comprising:

providing an automatic teller machine on a plurality of said islands, at least a first of said automatic teller machines having a first portion, said first portion being used in controlling operation of said first automatic teller machine, said first automatic teller machine also having a second portion operatively associated with said first portion;

providing a protective housing for each of said automatic teller machines, said housing including a front panel in which said first portion is positioned;

providing means for permitting movement of said first automatic teller machine from a first position to a second position, said second position being over a portion of said driveway adjacent to said first automatic teller machine;

moving said first automatic teller machine to said second position over said driveway; and

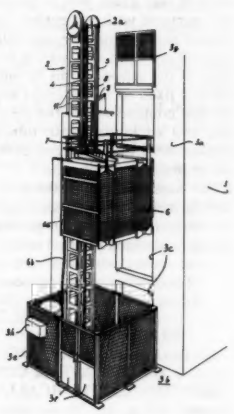
entering said first automatic teller machine by an entryway in said housing to gain access to said second portion of said first automatic teller machine, said entryway being located separate and away from said first portion of said automatic teller machine and wherein said front panel remains unopened while gaining access to said second portion of said first automatic teller machine so that a mechanic may enter said housing to service said first automatic teller machine without blocking the driveway of an adjacent automatic teller machine.

4,557,353

SERVICE ELEVATOR FOR CONSTRUCTION

Michel A. Pichon, 24 Rue Wilson, 69150 Décines, France

Filed May 11, 1983, Ser. No. 493,743
Claims priority, application France, May 11, 1982, 82 08740
Int. Cl.[4] B66B *9/00, 9/20*
U.S. Cl. 187—2 **9 Claims**



1. A construction elevator having a mast adapted to be secured to a structure, a cabin displaceable along a face of said mast, and means for displacing said cabin along said mast, said mast comprising:

an assembly of sheet metal panels of rectangular outline having flanges along longitudinal edges and provided along said flanges and proximal to said flanges with rows of equispaced holes alignable with the holes of adjoining panels whereby four such panels can be joined at right angles to define a rectangular cross section of said mast and said panels along each side of the rectangular cross section have contiguous borders;

bolts traversing holes of angularly adjoining panels for securing them together; and

a pair of rails extending along said face and secured to said mast by said bolts whereby said bolts simultaneously secure said rails to said panels, said rails are formed unitarily on panels disposed along said face of said mast.

4,557,354
ATTACHMENT OF SEALING BOOT IN DISC BRAKE ASSEMBLY

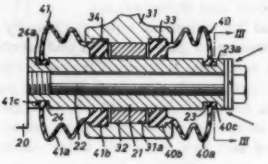
Shigemi Sakakibara, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jul. 22, 1983, Ser. No. 516,278

Claims priority, application Japan, Jul. 28, 1982, 57-114218[U]

Int. Cl.⁴ F16D *65/00*

U.S. Cl. 188—73.45 **2 Claims**



1. In a disc brake assembly which comprises a pair of parallel guide pins fixed to a stationary torque member, a movable caliper member having a pair of tubular sealing boots for each support arm, the two boots of each pair having inner ends attached to the corresponding one of said support arms and having outer ends attached to the correspondone of said guide pins in such a way as to enclose a pair of annular openings formed between said support arm and said guide pin at opposite inner and outer sides of said support arm, and in which each of said guide pins is formed at opposite inner and outer end portions with respective inner and outer annular grooves spaced axially from the opposite inner and outer sides of said support arm, and said sealing boot located on the outer side of each of the support arms includes an inner cylindrical sealing portion fixed to said support arm, an outer cylindrical sealing portion coupled within the outer annular groove of said guide pin, and an intermediate tubular bellows portion integrally formed with the inner and outer cylindrical sealing portions, the improvement wherein

the outer annular groove of said guide pin is integrally formed at its outer side wall with a plurality of equiangularly spaced axial projections which extend inwardly and are arranged to press radially inwardly the outer cylindrical sealing portion of said boot against the bottom surface of said outer annular groove and to retain said outer cylindrical sealing portion in place.

4,557,355
SYSTEM FOR CONTROLLING AN ELECTROMECHANICALLY RECIPROCABLE LOAD

Richard Wilke, Am Weissenfeld 4, D-5830 Schwelm, and Helmut Korthaus, Fernblick 3, D-5600 Wuppertal 2, both of Fed. Rep. of Germany

Continuation-in-part of Ser. No. 420,783, Sep. 21, 1982, abandoned, which is a continuation-in-part of Ser. No. 244,302, Mar. 16, 1981, abandoned. This application Nov. 18, 1982, Ser. No. 442,762

Claims priority, application Fed. Rep. of Germany, Mar. 18, 1980, 3010335

Int. Cl.⁴ B60T *13/04*

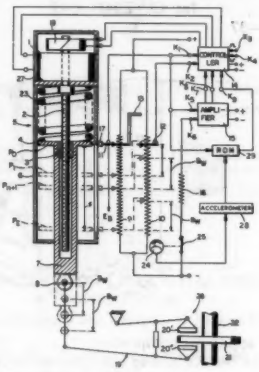
U.S. Cl. 188—173 **6 Claims**

1. A system for selectively reciprocating a load between a retracted position and a working position, comprising:

spring means mechanically coupled with said load for driving same in a forward stroke from said retracted position to said working position, said spring means being under a maximum stress in the retracted position of said load;

a rotary electric motor operatively coupled with said load and provided with an energizing circuit for exerting thereon a countervailing force opposing the driving force of said spring means;

control means in said energizing circuit for modifying said countervailing force in response to external commands for yieldingly resisting said driving force during a forward stroke and for overriding said driving force in a return stroke, said control means including a position sensor in the form of a first potentiometer having a wiper entrainable by said load for progressively reducing said countervailing force in the course of a forward stroke in substantial conformity with the progressive diminution of said driving force due to relaxation of the stress of said spring means, said first potentiometer constituting part of a bridge circuit with a first diagonal defined by said wiper and by a reference point, said control means further comprising a switching circuit connected across said first diagonal and a power supply connected across a second diagonal of said bridge circuit for energizing said motor in an unbalanced state of said bridge circuit, said motor being



provided with brake means for immobilizing same in a balanced state of said bridge circuit, said brake means being releasable by an external command initiating a forward stroke, said reference point being a wiper of a second potentiometer connected in parallel with the first potentiometer across said second diagonal, said load including an actuating member of a power brake with linings subject to wear; and

a lost-motion coupling between said wipers, the wiper of said second potentiometer being entrainable by said actuating member through said lost-motion coupling with a lag relative to the wiper of said first potentiometer establishing a balanced state of said bridge circuit in positions along said potentiometers advancing with progressive wear of said linings whereby even application of the brake is ensured with such wear.

4,557,356
BRAKE DISK AND KEYSLOT REINFORCEMENTS THEREFOR

Don W. Petersen, North Canton, Ohio, assignor to Goodyear Aerospace Corporation, Akron, Ohio

Filed Apr. 30, 1984, Ser. No. 605,087

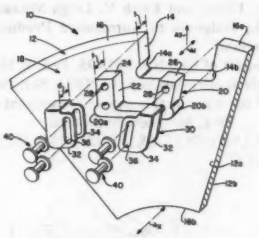
Int. Cl.⁴ F16D *65/12*

U.S. Cl. 188—218 XL **10 Claims**

1. A friction disk having opposite surfaces forming annular braking faces lying in planes transverse to an axis of rotation of the disk and a plurality of evenly-spaced, substantially T-shaped slots formed within a peripheral edge of the disk and extending therethrough from one braking face surface to the other, a top portion of the T-shaped slot being oriented radially inwardly from the peripheral edge of the disk; and

a keyslot reinforcement means mounted within each of said T-shaped slots comprising a metallic insert member hav-

ing a substantially T-shaped peripheral configuration which matches the T-shaped slot in the disk such as to be received in mating relationship within the slot in the axial direction from one braking face surface of the disk to the other but restrained from being removed from the slot in



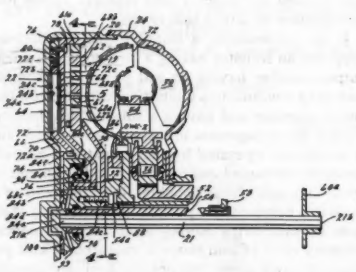
the radial direction, said insert member having a substantially U-shaped keyslot formed therein and facing radially outwardly of the disk and, retaining means fastened to opposite sides of the insert member and extending to coact with the face surfaces of the disk such as to capture the insert member within the T-shaped slot.

4,557,357

TORSION DAMPING MECHANISM WITH A VISCOUS COUPLING

Thomas H. Tinholt, Marshall, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed May 29, 1984, Ser. No. 615,012
Int. Cl.⁴ F16D *3/14*
U.S. Cl. 192—3.21 **10 Claims**



1. In a driveline including a hydrokinetic coupling having an impeller and a turbine disposed within a hydrokinetic coupling housing mounted for rotation about an axis with the hydrokinetic housing defining an impeller input drive and the turbine being connected to a first output drive rotatable about the axis; a torsion damping mechanism having resilient means interconnecting the input drive and a second output drive rotatable about the axis, and torsion damping means disposed in parallel with the resilient means; the improvement comprising:

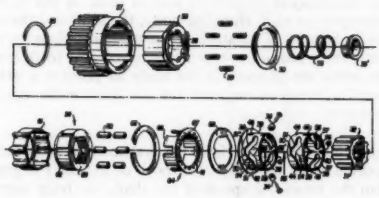
a viscous coupling defining said damping means, said viscous coupling including a housing assembly fixed for rotation with the hydrokinetic housing and defining an annular chamber containing a viscous liquid, a clutch assembly including an annular clutch member fixed for rotation with the second output drive and disposed in said chamber for viscous clutching coaction with the housing assembly in response to flexing of the resilient means, said housing assembly including a first annular wall member defined by a wall portion of the hydrokinetic housing and a second annular wall member fixed for rotation with and spaced from said first annular wall member to define said chamber.

4,557,358

SYNCHRONIZED CLUTCH ASSEMBLY WITH SELECTIVE OVERRIDE FOR FOUR-WHEEL DRIVE VEHICLES

Harry A. Petrak, Boulder, Colo., assignor to Tenneco Inc., Lincolnshire, Ill.

Filed Mar. 4, 1983, Ser. No. 472,028
Int. Cl.⁴ F16D *11/06, 43/02;* B60B *27/00*
U.S. Cl. 192—35 **17 Claims**



1. In a clutch having an actuator mechanism operative to drivingly interconnect rotatable drive and driven members when torque is applied to said drive member, said actuator mechanism comprising:

cam control means normally fixed against rotation;

cam follower means movable in response to the application of torque to said drive member to cause said drive member to be drivingly connected to said driven member; and

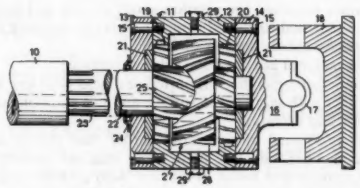
a locking member including spaced inner and outer concentric portions, one of said portions permanently fixed against rotation, and releasable locking means interposed between said inner and outer concentric portions normally locking the other of said portions against rotation, said cam control means connected to said other of said portions so as to be normally locked against rotation, and said releasable locking means being releasable under applied rotative force to said other of said portions by said cam control means prior to release of said cam follower means from locking engagement with said locking member.

4,557,359

TRANSMISSION SYSTEMS FOR VEHICLES

Samuel A. Woodbridge, 85 Bunya St., Greenslopes, Australia

PCT No. PCT/AU82/00170, § 371 Date May 31, 1983, § 102(e) Date May 31, 1983, PCT Pub. No. WO83/01494, PCT Pub. Date Apr. 28, 1983
PCT Filed Oct. 15, 1982, Ser. No. 499,156
Claims priority, application Australia, Oct. 15, 1981, PF1188
Int. Cl.⁴ F16D *41/04, 41/06, 43/04, 43/30*
U.S. Cl. 192—43 **6 Claims**



1. A transmission coupling for a vehicle including:

a substantially tubular body;

a respective set of helical gear teeth provided circumferen-

tially around the interior of the body at each end of the body;

a shaft rotatably mounted in the body, coaxially with the plurality of teeth;

helical spline means extending along the shaft;

a sliding gear rotatably mounted on the shaft, the sliding gear having a plurality of internal helical gear teeth in engagement with the helical spline means on the shaft and a plurality of external helical gear teeth;

the sliding gear being so arranged to be movable along the shaft between a first position, where the external gear teeth engage a first set of teeth in the body to provide a driving coupling between the shaft and the body in one direction, a second position where the external gear teeth are dis-engaged from both sets of teeth in the body to decouple the shaft from the body, the shaft and the body being capable of rotating at different rotational speeds, and a third position where the external gear teeth engage the other set of teeth in the body to provide a driving coupling between the shaft and the body in the opposite direction;

wherein:

the sliding gear is moved from the first position to the second position when the rotational speed of the body is greater than the rotational speed of the shaft, the body forming the output side of the coupling;

the sliding gear is moved from the second position to the third position, engaging the other set of teeth, when the shaft is rotated in the opposite direction, and

the spline means on the shaft and the internal gear teeth on the sliding gear are of one hand, and the teeth in the body and the external gear teeth on the sliding gear are of opposite hand, the sliding gear locking the shaft to the body when the external gear teeth on the sliding gear engage the sets of teeth in the body.

4,557,360

MOVABLE DISC FOR ELECTROMAGNETIC CLUTCH/BRAKE

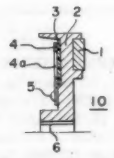
Hiroshi Kumatani, Nagoya, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 25, 1983, Ser. No. 469,698

Claims priority, application Japan, Feb. 26, 1982, 57-30409

Int. Cl.⁴ F16D *3/12, 27/14*

U.S. Cl. 192—84 R **11 Claims**



1. A movable disc for an electromagnetic clutch/brake, comprising:

an armature mounted for rotation about an axis and movement along said axis, said armature having opposite first and second axially spaced surfaces;

a friction material attached to said first surface;

an annular elastic member supported and held with one side in contact with said second surface and in a position coaxial with said armature;

a face plate formed of a material harder than that of said elastic member, said face plate being attached directly to said armature and being in contact with another side of said elastic member for supporting and holding said elastic member in contact with said armature, said face plate having perforations constructed and positioned such that a surface area of said face plate contacting said elastic member is smaller than a surface area of said another side of said elastic member, whereby the mass of said face plate is reduced.

4,557,361

SHIPPING AND INSTALLATION STRAP FOR LINEAR ACTUATOR

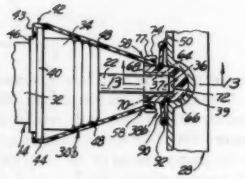
Richard A. Nix, Utica, and Keith V. Leigh-Monstevens, Troy, both of Mich., assignors to Automotive Products plc, Warwickshire, England

Continuation-in-part of Ser. No. 344,495, Feb. 1, 1982, Pat. No. 4,452,632. This application Sep. 13, 1982, Ser. No. 417,336

The portion of the term of this patent subsequent to Jun. 19, 2001, has been disclaimed.

Int. Cl.⁴ F16D *25/08, 25/12;* **F15B** *15/26*

U.S. Cl. 192—85 C **15 Claims**



1. In an actuator for operation a motor vehicle clutch release arm, said arm having a partially spherical concave recess and said actuator having a linearly movable output rod, a cylindrical cap fitted on the end of said rod, a substantially hemispherical end portion on said cap for engagement in said partially spherical concave recess, and a disc-shaped flange integrally formed radially on the periphery of said cylindrical cap, said flange having an edge resiliently engaging said clutch release arm beyond the edge of said concave recess for preventing introduction of dirt in said recess.

4. In combination, a shipping and installation restraining strap and an actuator having a housing and a linearly movable output member having an end projecting from said housing, said strap comprising a cylindrical cap fitted on the end of said output member and having a substantially hemispherical end portion for engagement in a partially spherical concave recess in an element operated by said actuator, a pair of strips symmetrically arranged and each attached at an end to said cylindrical cap, and means attaching the other end of each of said strips to a non-movable portion of the housing of said actuator, each of said strips having a portion of reduced strength, whereby each of said strips is ruptured at said portion of reduced strength upon first operation of said actuator.

4,557,362

CLUTCH DISC

Tamio Nagano, Hirakata, Japan, assignor to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan

Filed Mar. 8, 1983, Ser. No. 473,271

Claims priority, application Japan, Aug. 26, 1980, 55-121551[U]

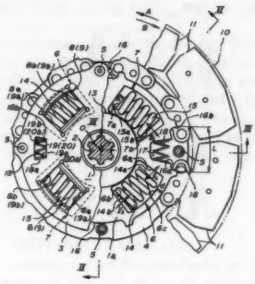
Int. Cl.⁴ F16D *3/14*

U.S. Cl. 192—106.2 **4 Claims**

1. In a clutch disc comprising a hub flange having a plurality of window holes arranged on a circumference thereof, an inner resiliently deformable coil spring fitted into each of said window holes with its axis extending in the circumferential direction, said flange being formed at an outer peripheral edge with a plurality of stop pin notched portions of a prescribed length in the circumferential direction centrally positioned between window holes, side plates positioned at each side of said hub flange and having window holes formed therein to engage said inner coil springs, and said side plates being connected by stop pins adapted to engage with said stop pin notched portions to

provide a prescribed play in the circumferential direction, the improvement comprising:

coil receiving notches formed in said stop pin notched portions of said hub flange integrally connected with and extending inwardly from peripheral edges of said notched portions so that the outer peripheral edges of said coil



receiving notches are radially farther out than the outer periphery of said window holes of said inner coil springs;

outer coil springs disposed in said coil receiving notches and extending circumferentially with their outer portions at said outer peripheral edges of said notches; and

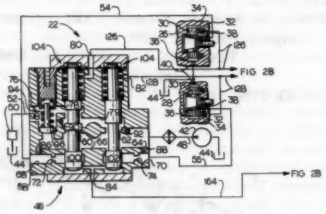
window holes formed in said side plates and adapted to engage said outer coil springs.

4,557,363

FRICTION COUPLE COOLING SYSTEM RESPONSIVE TO ACTUATION THEREOF

Kenneth F. Golan, Pekin, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 12, 1983, Ser. No. 560,680
Int. Cl.⁴ F16D *13/72*
U.S. Cl. 192—113 B **16 Claims**



1. In a friction couple cooling system including a source of pressurized control fluid, a source of cooling fluid, a fluid pathway through the friction couple, and an actuator for actuating the friction couple, the improvement comprising:

valve means for continuously directing a predetermined volume of cooling fluid to said fluid pathway during disengagement and full engagement of the friction couple and for increasing the pressure of the cooling fluid delivered to said fluid pathway and increasing the volume of cooling fluid to said fluid pathway only during partial engagement of said friction couple, and

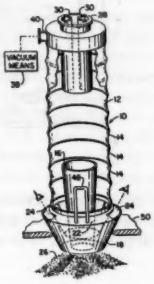
control means for controlling actuation of said friction couple and for controlling actuation of said valve means during partial engagement of said friciton couple.

4,557,364

BULK CONVEYOR APPARATUS

David C. Ball, La Puente, Calif., assignor to The W. W. Sly Manufacturing Co., Cleveland, Ohio

Continuation of Ser. No. 126,531, Mar. 3, 1980, Pat. No. 4,492,294. This application Jan. 3, 1985, Ser. No. 688,614
The portion of the term of this patent subsequent to Jan. 8, 2002, has been disclaimed.
Int. Cl.⁴ B65G *11/00*
U.S. Cl. 193—25 C **13 Claims**



1. A bulk conveyor, comprising:

duct means having an elongated structure for conveying an associated bulk material therealong in a first direction for exit at an outlet end thereof;

means for confining a fluid stream flowing in a second direction generally opposite to said first direction at least adjacent said outlet end, said fluid stream adapted to continuously remove dust and like particles from the area of said outlet end as an associated bulk material exits therefrom; and,

means attached to move with said duct means for visually monitoring bulk material exiting said outlet end, said monitoring means including a viewing passage having a first end disposed adjacent said outlet end in radial outward spaced relation thereto from both said outlet end and said confining means, whereby said confining means continuously removes dust and like particles generated by an associated bulk material exiting said outlet end in order that said viewing passage will be generally clearer for accommodating visual monitoring of the bulk material externally of said outlet end.

4,557,365

COIN OPERATED LOCK UNIT

Wells F. Stackhouse, Leesburg, Fla., assignor to American Locker Security Systems, Inc., Jamestown, N.Y.

Filed Dec. 14, 1983, Ser. No. 561,237
Int. Cl.⁴ G07F *5/04*
U.S. Cl. 194—1 G **35 Claims**

1. A coin operated lock unit comprising in combination:

a patron controlled lock;

a custodian controlled lock;

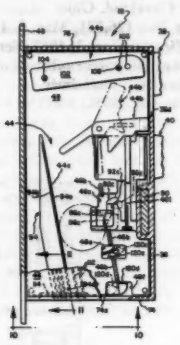
a coin chute;

means responsive to insertion of at least one coin of a given denomination into said coin chute for freeing said patron lock for movement from an unlocked position into a locked position thereof;

a lock bolt movable between unlocked and locked positions;

drive means for normally coupling said lock bolt to said patron lock for effecting movements of said lock bolt back and forth between said unlocked and locked positions thereof coincident with movements of said patron lock back and forth between said unlocked and locked positions thereof; and

drive means control means under the control of said custodian lock for uncoupling said lock bolt from said patron



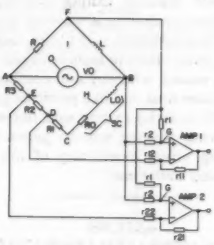
lock and effecting movements of said lock bolt back and forth between said locked and unlocked positions thereof, while said patron lock is in said locked position thereof.

4,557,366

COIN SORTER

Shinji Yokomori, and Yoshio Ushijima, both of Nagano, Japan, assignors to Fuji Electric Company, Kanagawa, Japan

Filed Sep. 28, 1983, Ser. No. 536,902
Claims priority, application Japan, Sep. 28, 1982, 57-169271
Int. Cl.[4] G07D *5/08*
U.S. Cl. 194—100 A **6 Claims**



1. A coin sorter for detecting a plurality of denominations of coins which roll along a coin passage, comprising:

an AC bridge circuit having a detecting coil in a first bridge arm positioned along said coin passage, a reactance element in a second bridge arm, and a plurality of resistors connected in series in a third bridge arm for obtaining fractions of the voltage developed across said third arm in response to the different coins;

differential amplifiers circuits associated with the different coins and connected to receive voltage signals from different taps between said resistors, and to compare the voltages obtained with a voltage proportional to the voltage developed across the reactance element;

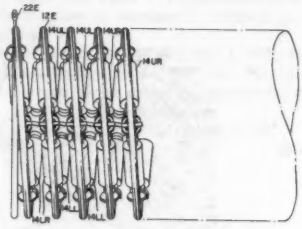
and wherein said resistor values, reactance element value and differential amplifier circuit amplification factors are selected so that said differential amplifiers produce output signals respectively indicating the different coin denominations.

4,557,367

HELICAL CONVEYOR

Jonathan P. Kulp, York, Pa., assignor to Harsco Corporation, Wormleysburg, Pa.

Filed Feb. 23, 1982, Ser. No. 350,802
Int. Cl.[4] B65G *15/26*
U.S. Cl. 198—313 **17 Claims**



1. An apparatus including a conveyor having a conveyor axis comprising:

(a) driving surface portions at a plurality of locations along said conveyor axis, said driving surface portions including a plurality of right lower and left lower driving surface portions,

(b) support structure supporting said driving surface portions, and

(c) a motor for driving said driving surface portions by rotating said driving surface portions askew to said conveyor axis; and

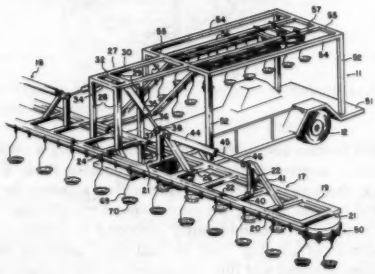
wherein rotation of said driving surface portions is operable to move articles supported by said right lower and left lower driving surface portions in a direction along said conveyor axis, and wherein said conveyor has an extended length along said conveyor axis and a retracted length along said conveyor axis shorter than said extended length, said support structure comprises a helical skeleton supporting said driving surface portions and extendable and retractable lengthwise along said conveyor axis to change the length of said conveyor.

4,557,368

FIELD CROP HARVESTING AND PACKING MACHINE

Melford N. Alameda, Fremont, Calif., assignor to The Alameda Company, Fremont, Calif.

Filed Mar. 5, 1984, Ser. No. 586,248
Int. Cl.[4] B65G *17/00*
U.S. Cl. 198—313 **8 Claims**



8. A harvester for loading product into cartons in the field comprising:

a wheeled vehicle having a platform on which workers can stand and load product into cartons,

a wing extending from at least one side of said wheeled

vehicle, said wing including hinged joints to allow the ends to be folded vertically to level the wing as the vehicle rolls over uneven ground and to reduce the width of the harvester for turning the road and transportation,

an endless conveyor comprising:

an endless flexible member mounted on rollers to extend along said wing and along said vehicle,

a plurality of hanging trays each including a vertically extending support fixed at the upper end to said flexible member,

a drive motor for driving said flexible member lengthwise to move said trays along said wing and said vehicle to carry product loaded thereon at the wing back to the vehicle,

means to raise and lower the outer ends of said wing to allow leveling and road transportation of said harvester, and

means to maintain said flexible member taut as the wing is raised and lowered thereby to maintain the conveyor operable.

4,557,369

MOVING STAIRCASE

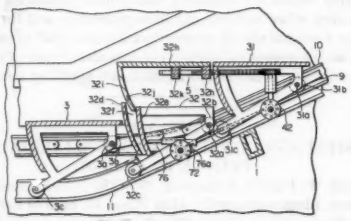
Matsuhiko Ishida; Masaru Asano; Shigeru Goto, all of Inazawa, and Takeshi Sakurai, Tokyo, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 29, 1984, Ser. No. 626,125

Claims priority, application Japan, Jul. 5, 1983, 58-122107

Int. Cl.⁴ B65G *9/12, 17/00*

U.S. Cl. 198—333 **8 Claims**



1. A moving staircase comprising:

a main frame disposed substantially obliquely and constituting a circulating path comprising an oblique load run on its upper side, an oblique return run on its lower side, and direction changing paths connecting said load and return runs at the lower and upper ends, whereby substantially horizontal upper and lower parts are formed in said load run at said direction changing path respectively;

a number of tread boards of a first kind which are articulated together in an endless fashion along said circulating path so as to be normally continuously circulated in one direction such that they move substantially horizontally at said upper as well as lower ends but move obliquely upwards with each of said tread boards being maintained substantially horizontally during their travel along said oblique load run of said circulating path;

at least one tread board of a second kind arranged in said main frame so as to be disposed between any two of said tread boards of the first kind and to be circulated therewith, said tread board of the second kind being provided below it with fork means, by a forward and rearward movement mechanism also provided, below said fork means for normally holding said fork means at a retracted position and for urging said fork means to be protruded substantially horizontally towards said lower end of said circulating path when said forward and rearward movement mechanism is actuated;

at least one tread board of a third kind arranged in said main frame so as to adjoin said tread board of the second kind at its rear end portion and to be moved together with said tread board of the first kind, said tread board of the third kind being provided with a movable footboard which is movable up and down relative to said tread board of the third kind and with its upper surface maintained horizontally and which is normally held at a lowered position, but which, upon actuation of said forward and rearward movement mechanism is moved upwards as said tread board of the second kind moves along said oblique loading run and is firmly supported by said fork means which are caused to be protruded towards said movable footboard to firmly support it;

a pair of upwards and downwards driving mechanisms provided at said upper and lower ends of said circulating path, respectively, a horizontal longitudinal frame which is secured to said main frame below said upper load run centrally thereof and on which each of said pair of upwards and downwards driving mechanisms is mounted, said upwards and downwards driving mechanism usually being held at a lowered position, but when said tread boards of the second and third kinds are stopped at said upper or lower end of said circulating path, the corresponding upwards and downwards driving mechanism is adapted, if required, to actuate said forward and rearward mechanism so that it operates to cause said fork means provided in said tread board of the second kind to protrude towards or retract from said tread board of the third kind.

4,557,370

FINGER APPARATUS FOR AN IDLE STATION IN A TRANSFER PRESS

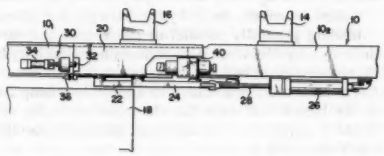
Toshihiro Tanaka, Komatsu, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Mar. 14, 1984, Ser. No. 590,300

Claims priority, application Japan, Mar. 14, 1983, 58-35394[U]

Int. Cl.⁴ B65G *25/00*

U.S. Cl. 198—621 **2 Claims**



1. In a transfer press including a pair of transfer bars each comprising an upstream side end bar, a central bar and a downstream side end bar detachably interconnected with each other and a moving bolster, said central bar being adapted to be moved in and out of said press together with said moving bolster, said transfer press having at least one idle station provided therein, a finger apparatus for the idle station, the improvement comprising:

a finger;

a mounting plate having said finger mounted thereto;

a quadric linkage connected at one end thereof to said mounting plate and at the other end to said central bar; and

cylinder means having one end connected to said linkage and the other end connected to said central bar for moving said mounting plate between a first position where said mounting plate is abutted on the upper surface of one of said end bars and a second position where said mounting plate is held above said central bar such that said finger may be moved in and out of said transfer press with said moving bolster.

4,557,371
WORK-CLAMP PALLET FOR MACHINE TOOL

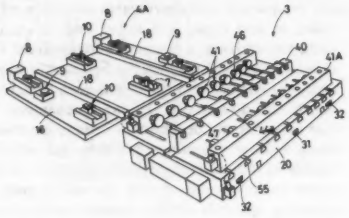
Keitaro Yonezawa, Itamishi, Japan, assignor to Aioi Seiki K. K., Itamishi, Japan

Filed Jul. 2, 1982, Ser. No. 394,871

Claims priority, application Japan, Jul. 17, 1981, 56-106968[U]

Int. Cl.⁴ B65G *47/00*

U.S. Cl. 198—803.01 **20 Claims**



1. A pallet for clamping a plurality of workpieces on a vertical machine tool comprising:

(a) a base block of generally rectangular shape and having X and Y axes and an upper workpiece mounting surface;

(b) means to attach the base block to the bed of the machine tool in a fixed, pre-determined position;

(c) a standard frame attached to an upper surface of the base block and extending generally parallel to the X axis, the standard frame having a pair of oppositely facing work positioning faces;

(d) a plurality of positioning stoppers removably attached to the standard frame so as to define a plurality of work clamping stations along the length of the standard frame; and,

(e) clamping means disposed on both sides of the standard frame, each clamping means comprising:

(i) a clamp frame attached to the upper surface of the base block so as to extend generally parallel to the standard frame, the clamp frame defining a plurality of hydraulic cylinder chamber, each hydraulic cylinder chamber extending generally parallel to the Y-axis, and further defining a hydraulic oil path connecting to each hydraulic cylinder chamber;

(ii) adjustable attaching means to attach the clamp frame to the base block such that the position of the clamp frame is adjustable in a direction generally parallel to the Y-axis; and,

(iii) a plurality of hydraulic cylinder clamping devices, each device slidably mounted in a hydraulic cylinder chamber of the clamp frame so as to be aligned with each work clamping station, the clamping devices each exerting a clamping force generally parallel to the Y axis so as to clamp a workpiece between the clamping device and a work positioning face of the standard frame.

4,557,372
BELT SYSTEM WITH ALIGNMENT APPARATUS

Ganesh Rajagopal, Richardson, Tex., assignor to The Mead Corporation, Dayton, Ohio

Filed Aug. 13, 1984, Ser. No. 640,274

Int. Cl.⁴ B65G *39/16*

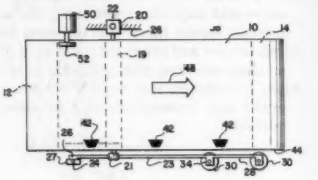
U.S. Cl. 198—807 **7 Claims**

1. In a belt system of the type having a transparent belt entrained about driving and s.,pport rollers, an improved alignment apparatus comprising:

a plurality of opaque flags positioned along said belt at equal distances from an edge thereof, each of said flags shaped to taper in length along a dimension transverse to said belt;

light source means for directing a beam of light through said belt such that said beam is broken by said flags as said belt moves about said rollers;

light sensor means fixed on an opposite side of said belt from said light source means for detecting transmission of said beam through said belt within a window narrower in width than a width of said flags, said window positioned such that the length of said flags move thereacross as said belt moves about said rollers, and for generating a first signal so long as one of said flags obscures said beam from said window;



encoder means for sensing movement of said belt about said rollers and for generating pulses in response thereto having a frequency proportional to a rate of movement of said belt;

tracking means for adjusting the position of said belt laterally relative to said support rollers; and

control means for counting said pulses generated during a period when said first signal is generated, and for generating a second signal, proportional to the total of said pulses which are counted during the traverse of one of said flags across said window, to actuate said tracking means.

4,557,373
SYSTEM FOR CONVEYING BULK MATERIAL AND PEOPLE IN A MINE

Friedrich W. Paurat, Kasselweg 29, 4230 Wesel 1, and Boland Paurat, Blumenstrasse 11, 4230 Wesel 13, both of Fed. Rep. of Germany

Filed Mar. 9, 1984, Ser. No. 586,866

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1983, 3308918

Int. Cl.⁴ B65G *15/08*

U.S. Cl. 198—819 **16 Claims**

1. A conveyor system comprising:

a track defining an endless path traversing a loading station and an unloading station and having a transport stretch therebetween;

conveyor belt means travelling along said track and includ-

ing an annular succession of longitudinally spaced trucks riding on the track and

an endless conveyor belt extending along the track and having a pair of longitudinally extending edges one of which is suspended from every other truck and the other of which is suspended from the remaining trucks;

drive means extending along the track and engageable with the trucks for advancing the belt in a longitudinal transport direction from the loading station through the transport stretch to the unloading station and then back to the loading station;

at least one carrier;

at least one respective hanger having a lower end secured to the carrier and an upper end; and

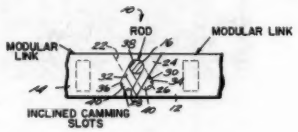
means for attaching the upper end of the hanger to the conveyor belt means and for thereby suspending the carrier from the conveyor belt means in the transport stretch.

4,557,374

MODULAR CONVEYOR BELTING WITH CAM-SLOTTED LINKS FOR MAINTAINING TRANSVERSE DISTRIBUTION OF TENSION WHILE NEGOTIATING HORIZONTAL CURVES AND FOR FACILITATING CLEANING

Robert H. Bode, Wenham, Mass., assignor to The Cambridge Wire Cloth Company, Cambridge, Md.

Filed Feb. 23, 1982, Ser. No. 351,629
Int. Cl.⁴ B65G *17/06*
U.S. Cl. 198—852 **72 Claims**



1. For an endless conveyor belt, a link, which, when incorporated in a longitudinally progressing series including a plurality of such links, with each two longitudinally adjacent ones of such links pivotally pinned together crosswise of the conveyor belt for mutual vertical pivotal movement about respective horizontal axes in order to negotiate vertical turns, equips the conveyor belt to also selectively longitudinally condense along at least one lateral margin, hereinafter designated an inner lateral margin, with belt tension spread across such links, said link comprising:

a body;

said body having a plurality of at least three leading link ends distributed across the width thereof and a plurality of at least three trailing link ends distributed across the width thereof, the leading and trailing link ends being so laterally spaced that the leading link ends of a said link may be intercalated with the trailing link ends of a first, like link when leading said link and so that the trailing link ends of said link may be intercalated with the leading link ends of a second, like link when trailing said link;

each link end having means defining a laterally opening slot therein for receiving a leading rod for pivotally connecting said link to said first, like link and for receiving a trailing rod for pivotally connecting said link to said second, like link;

each slot being elongated in an oblique direction, with that oblique direction of the slots in the leading link ends being a mirror image of that oblique direction of the slots in the trailing link ends;

each slot comprising a perimetrical sidewall one portion of which provides a camming surface which is oriented in said oblique direction,

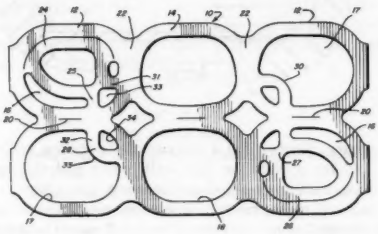
whereby when said link is assembled with the links and the links are pivotally interconnected by rods extending through respective slots of the intercalated link ends and the belt is run longitudinally under normal tension the links including said link tend to separate longitudinally of the conveyor belt as far as possible, given the spatial disposition of each rod, regardless of whether the belt is run along a straight path or one which includes a lateral curve, with the respective rods in tension-spreading engagement with said camming surfaces of said at least three leading link ends and said at least three trailing link ends of the links, including said link.

4,557,375

MULTI-PACKAGING DEVICE

William N. Weaver, Northbrook, and Robert C. Olsen, Streamwood, both of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.

Filed Aug. 3, 1984, Ser. No. 637,625
Int. Cl.⁴ B65D *85/72*
U.S. Cl. 206—151 **6 Claims**



1. A package making device for unitizing a plurality of containers, the device formed from a resilient elastic deformable sheet of plastic material and comprising at least two rows and three ranks of integrally connected bands creating reconfigurable container receiving and gripping apertures, a longitudinal axis defined substantially midway between the lateral edges of the device, the rows being situated on opposing sides of said longitudinal axis and being non-symmetrical relative to said longitudinal axis, a plurality of rank axes perpendicularly disposed to said longitudinal axis, lateral web means lying on the longitudinal axis integrally connecting pairs of adjacent apertures in a given rank, longitudinally web means integrally connecting pairs of adjacent apertures in a given row, a pair of finger gripping loop members each extending from the inner margin of diagonally opposite apertures in the end ranks of the device, each loop member emanating from and secured by hinge means to a corner quadrant at the inner margin of said diagonally opposite apertures which is between the lateral and longitudinal web means associated with one of a pair of apertures in the end ranks apertures, the other of each pair of end rank apertures including force compensating web means extending thereinto from corner quadrants of said other pair of end rank apertures which are also between the lateral and longitudinal web means associated therewith, the hinge means and force compensating web means being on opposing sides of the longitudinal axis but laterally adjacent to each other to create similar stretch characteristics in the associated bands when lateral stretching forces are applied at the outer margins of the device.

4,557,376

SELF ACTIVATING AMALGAM CAPSULE

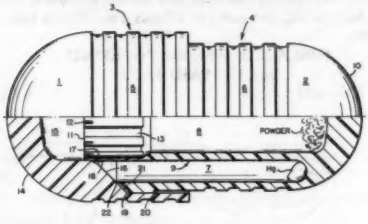
Robert L. Probst, and William A. Groves, both of Ann Arbor, Mich., assignors to Sybron Corporation, Rochester, N.Y.

Continuation-in-part of Ser. No. 307,992, Oct. 2, 1981. This application Jun. 6, 1983, Ser. No. 501,209
Int. Cl.⁴ B65D *81/32*
U.S. Cl. 206—219 **10 Claims**

1. A capsule for containing in unmixed condition the compo-

nents of a dental amalgam, said capsule having a mixing chamber, said chamber being provided by wall means, said wall means enclosing a space in said capsule such as to provide a surface which bounds said space and defines a mixing chamber shaped and dimensioned for mixing said components, if said components be present in said chamber while said capsule is being shaken;

said wall means also providing a mercury chamber for containing mercury, both said chambers being normally closed off from each other, with the mercury chamber containing mercury and said mixing chamber containing dental alloy, and there being sufficient space in said mercury chamber that if said capsule be shaken, said mercury strikes a place on said wall means and thereby exerts inertial force on said wall means at said place;



said wall means having valve means responsive to said force for deflecting a portion of said wall means into said chamber, such deflection altering the original shape of said surface while at the same time providing a way for mercury to both enter into said mixing chamber through said valve means and cease exerting said inertial force on said wall means at said place, said valve means being responsive to such cessation of exerting said inertial force for causing said portion of said wall means to deflect such as to restore said chamber to its said original shape.

4,557,377

MIXING BAG AND BAG MAKING APPARATUS

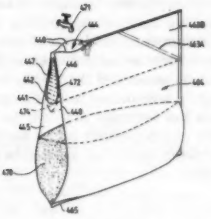
John Maloney, Alsager, England, assignor to Johnsen & Jorgensen Jaypak Limited, London, England

Continuation-in-part of Ser. No. 444,899, Nov. 18, 1982, Pat. No. 4,540,089. This application Oct. 14, 1983, Ser. No. 541,829

Claims priority, application United Kingdom, Oct. 16, 1982, 8229625; Jan. 18, 1983, 8301279

Int. Cl.⁴ B65D *30/24*

U.S. Cl. 206—219 **7 Claims**



1. In a bag formed from bonded flexible waterproof film material with a compartment and a pocket within the bag, said bag comprising:

(a) first opposed walls defining the compartment and second opposed walls located between the first opposed walls and defining the pocket and a mouth opening into the pocket,

(b) the pocket is interposed between the compartment and the mouth such that the pocket is separated from the compartment by the second opposed walls,

(c) at least a portion of the pocket is frangible to allow the pocket to be ruptured,

(d) said opposed walls are adapted to assume a face to face abutting relationship so that the abutting faces are held in a self-sealing position after rupture of the pocket to serve as a non-return valve between the compartment and the mouth, and

(e) a removable dispenser holding section is disposed adjacent the pocket to close the mouth until use of the bag is required.

4,557,378

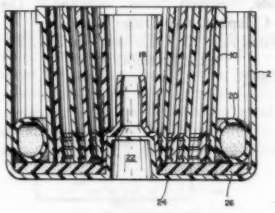
COMBINATION COLLAPSIBLE FUNNEL AND CANISTER THEREFOR

Franklin R. Klebold, P.O. Box 1721, Clovis, N. Mex. 88101

Filed Nov. 22, 1983, Ser. No. 554,398

Int. Cl.⁴ B65D *69/00*

U.S. Cl. 206—223 **8 Claims**



1. A combination collapsible funnel and canister therefor comprising a collapsible funnel means including a plurality of frusto-conical shaped funnel sections of various sizes which allow the sections to telescope and fit inside each other when collapsed and interfit when extended, a plurality of protrusions and indentations at the edges of said sections for engaging corresponding protrusions and indentations on adjacent sections when extended to form an interlocking interference fit seal between adjacent sections whereby inadvertent collapse of said funnel and leaking between said sections is prevented and canister means adapted to receive said funnel means when collapsed and having a protruding stud fixed to the base thereof internally said stud being of a size to fit into the smaller end of the smallest of said funnel sections.

4,557,379

CIRCUIT BOARD PACKAGE AND METHOD OF MANUFACTURE

Richard J. Lane, and Kurt L. Rozek, both of Dallas, Tex., assignors to Lane Container Company, Dallas, Tex.

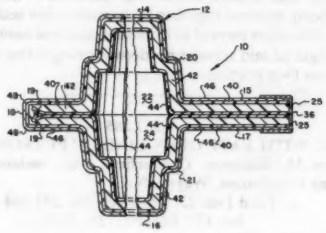
Continuation-in-part of Ser. No. 562,477, Dec. 16, 1983, abandoned. This application May 9, 1984, Ser. No. 608,381

Int. Cl.⁴ B65D *73/02, 85/30;* **H05F** *3/00, 3/02*

U.S. Cl. 206—328 **24 Claims**

1. A package for an electrical circuit device having an electrically conductive surface forming a shield to prevent electrical charges from adversely affecting said circuit device, said package comprising a container formed from impact resistant and shock dissipating thermoformed plastic, said container including opposed top and bottom sections, said top and bottom sections forming means for supporting said circuit device in said container and said top and bottom sections being joined by an integral hinge section, and electrically conductive sur-

face means on the exterior of said top, bottom and hinge sections of said container and forming a substantially continuous



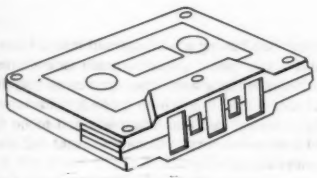
conductive path between said top and bottom sections through said hinge section.

4,557,380

MAGNETIC TAPE CASSETTE AND STORAGE CASE

Choji Komiyama; Kengo Oishi; Osamu Suzuki, all of Kanagawa, and Yasumasa Iyota, Tokyo, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 18, 1984, Ser. No. 632,147
Claims priority, application Japan, Jul. 18, 1983, 58-111380
Int. Cl.⁴ B65D *85/67*
U.S. Cl. 206—387 **7 Claims**



1. A magnetic tape cassette system comprising a magnetic tape cassette and a storage case therefor, wherein at least one of the magnetic tape cassette and the storage case is molded using a resin composition containing from 75 to 95% by weight of α-methylstyrene-acrylonitrile copolymer (A) and from 5 to 25% by weight of graft copolymer (B) obtained by reacting a polybutadiene-based rubber with monomers consisting of styrene and acrylonitrile, wherein said α-methylstyrene-acrylonitrile copolymer is a copolymer having a composition consisting of from 75 to 90% by weight of α-methylstyrene, from 10 to 25% by weight of acrylonitrile, and from 0 to 5% by weight of styrene, and 30% by weight or more of said α-methylstyrene-acrylonitrile copolymer is a copolymer component having a composition containing 82% by weight or more of α-methylstyrene.

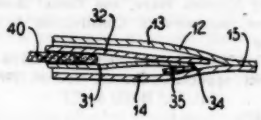
4,557,381

WRAP FOR IMPREGNATED DRESSING

William G. Whitney, Evanston, Ill., assignor to Alba-Waldensian, Inc., Valdese, N.C.

Filed Sep. 9, 1983, Ser. No. 530,662
Int. Cl.⁴ B65D *83/00, 75/00*
U.S. Cl. 206—440 **6 Claims**

1. A package for a sterile gauze dressing which is impregnated with a moist material, said package comprising an inner wrap for receiving and surrounding the dressing, said inner wrap being a one-piece sheet member having a first fold line to form a back panel and a front panel and said inner wrap having means for enabling easy opening of the front and back panels to remove the dressing therefrom, said means including a second fold line in one of the two panels adjacent a free edge thereof to form a flap with an area of the other panel of the two panels being exposed to form a second flap, said sheet member being of a sheet material having a resistance to the moist material and having an adhesion for the dressing which is less than the adhesion between layers of the dressing so that with an opening of the wrap, the dressing remains on one of said panels



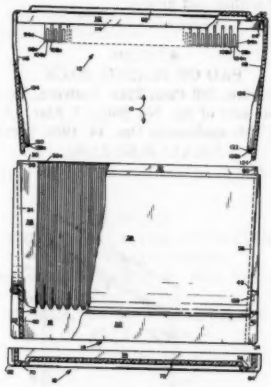
without being damaged; and an outer pouch of aluminum foil sealed around the inner wrap and dressing to maintain a sterile condition of said dressing and inner wrap, said outer pouch being composed of two sheets of material being sealed together adjacent each edge with tab means adjacent at least one edge to enable peeling of the two sheets apart to gain easy access to the inner wrap.

4,557,382

DISK PACKAGE

Douglas M. Johnson, Waconia, Minn., assignor to Empak Inc., Chanhassen, Minn.

Filed Aug. 17, 1983, Ser. No. 523,850
Int. Cl.⁴ B65D *85/57*
U.S. Cl. 206—444 **2 Claims**



1. Package for memory disks comprising:

a. disk cassette including lower opposing edges, opposing ends affixed to said edges, rounded disk supporting sides affixed to said lower edges, and overlapping perimeter encompassing each top edge of said rounded disk supporting sides, relief area in each of said ends, vertical edges extending outwardly and downwardly about said ends, rounded catch edges extending outwardly about said relief circumference, a plurality of opposing rounded sawteeth with spaces therebetween positioned on said rounded disk supporting sides of said box and extending inwardly;

b. bottom cover including a bottom substantially planar member, a draft extending into said planar member, a perimeter about said planar member including four encompassing corners and forming a channel therein; and,

c. top cover including a planar member, and outwardly extending draft member, two rows of opposing movable flexible members extending downwardly from said planar member, a downwardly extending perimeter extending

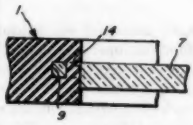
about sides and ends of said top planar member, downwardly extending oval ends including rounded circumferences extending slightly inward, and locking catches located about each end of said rounded circumference.

4,557,383

SHOCK PROOF CASE

Daniel Arnoux; Maurice Haye, and Daniel Bonneau, all of Paris, France, assignors to Construction D'Appareillage, Paris, France

Filed Nov. 28, 1984, Ser. No. 675,936
Claims priority, application France, Nov. 30, 1983, 83 19094
Int. Cl.⁴ B65D *81/02*
U.S. Cl. 206—521 **8 Claims**



1. A shockproof case comprising

a housing of moldable elastomeric material having a wall with an opening therein, at the periphery of which is formed an encasement groove; and

a plate of a material more rigid than said elastomeric material, which plate is encased at its peripheral region within said groove, said plate having a plurality of cavities formed in said peripheral region;

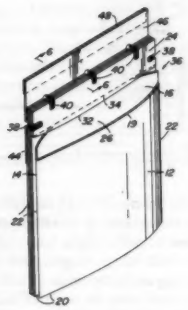
wherein said cavities are filled with said elastomeric material forming said case by means of a molding process to secure said plate within said groove.

4,557,384

PAD OF PLASTIC BAGS

Hercules Membrino, 280 Paoli Pike, Malvern, Pa. 19355

Continuation-in-part of Ser. No. 588,567, Mar. 12, 1984, Pat. No. 4,500,000. This application Dec. 14, 1984, Ser. No. 681,541
Int. Cl.⁴ B65D *85/62*
U.S. Cl. 206—554 **12 Claims**



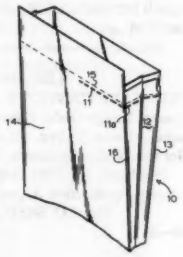
1. A pad of plastic bag units, said units being stacked to overly each other and being separably connected by a common base portion, each unit comprising a bag-forming pocket and a selvage portion, said pocket having a front wall, a rear wall, sealed side edges, a sealed bottom edge remote from said selvage portion and a cutaway portion of said front wall forming an open mouth of said pocket and having an upper edge adjacent said selvage portion, said selvage portion having front and rear walls to form a double-ply construction, and a line of weakness extending laterally from the top edge of said cutaway portion across the rear wall forming a continuous lateral line of severance defined by the top edge of said cutaway portion and said line of weakness, whereby said selvage portion fully retains its double-ply structure when said pocket is severed therefrom, a free edge in spaced parallel relation to the mouth of the pocket and side edges in common with the side edges of said pocket, the selvage portions of all the stacked units being secured together by common side securing means at the side edges thereof to form said common base portion, the free edges of said selvage portions forming a free edge of said common base portion.

4,557,385

BAG WITH EASY OPEN LINE OF PERFORATIONS

William M. Robinson, Chesterfield, Mo., assignor to Union Camp Corporation, Wayne, N.J.

Filed Feb. 23, 1984, Ser. No. 582,948
Int. Cl.⁴ B65D *33/36, 33/18*
U.S. Cl. 206—620 **7 Claims**



1. In a gusseted bag having a wall formed into a front face, a back face and a two panel gusset at each side of the bag connecting the faces along gusset edge creases and having an end which includes a fold line which extends transversely to said gusset edge creases, said end being adapted to be folded over along said fold line to form a closure for said end, an easy open improvement comprising:

a line of transverse perforations extending through the wall of the bag in at least one panel of one gusset and the one face connected to the said one panel of the said one gusset,

the said line of perforations being positioned within an area extending from at least ¼" from the said fold line to no more than ¼ of the combined widths of the panels of the said one gusset from the fold line and parallel thereto;

the said line of perforations in the said one face extending in length at least ¼" from the one edge crease connecting the said one face and said one gusset;

the first perforation of the said line of perforations in said one face being cut through the said one edge crease;

whereby a tear in the line of perforations can be started at the said edge crease and continued along the line of perforations to open the bag and provide easy access to the contents of the bag.

4,557,386

SYSTEM TO MEASURE GEOMETRIC AND ELECTROMAGNETIC CHARACTERISTICS OF OBJECTS

Bruce S. Buckley, San Jose; Edward M. Buckley, Milpitas, and Roy H. Reichwein, San Jose, all of Calif., assignors to Cochlea Corporation, San Jose, Calif.

Filed Jun. 27, 1983, Ser. No. 508,122
Int. Cl.⁴ B07C *5/344;* **G01S** *9/66*
U.S. Cl. 209—556 **35 Claims**

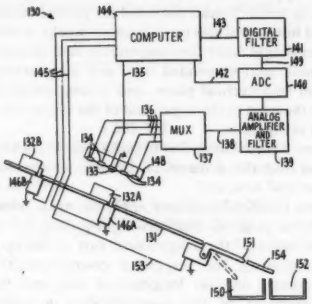
1. A method of measuring at least one of the geometric and electromagnetic characteristics of an object, that comprises:

directing continuous wave energy of a single frequency upon the object which interacts with same;

detecting the continuous wave energy which emanates from said object by virtue of the wave energy directed there-

upon by an array of spaced apart wave energy sensors to provide signals;

processing the signals from the sensors into amplitude and phase information for each of said sensors;



combining said amplitude and phase information in the signals of the array of sensors to provide a quantity X_j which represents said at least one of the geometric and electromagnetic characteristics of said object, wherein

$$X_j = g\left[\sum_{i=1}^{N} W_{ij} f(A_i, \theta_i)\right],$$

where

X_j is the desired output for a particular object j,

g is a functional relationship,

W_{ij} is a weighting function chosen for each sensor i and each object j,

f is another functional relationship,

A_i is the amplitude of the signals of each sensor i,

θ_i is the phase of the signals of each sensor i; and

acting upon said object on the basis of said quantity.

4,557,387

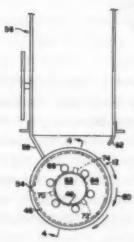
MAGNETIC DRUM FOR SEPARATING FERROUS AND NON-FERROUS BEVERAGE CONTAINERS

Robert L. Frenkel, Englewood, Colo., assignor to Adolph Coors Company, Golden, Colo.

Filed Apr. 27, 1984, Ser. No. 605,191

Int. Cl.[4] B07C *5/34*; B03C *1/14*

U.S. Cl. 209—636 **11 Claims**



1. A magnetic drum apparatus for separating ferrous beverage containers from non-ferrous beverage containers comprising:

plastic drum means for transporting said non-ferrous beverage containers a first predetermined distance and said ferrous beverage containers a second additional predetermined distance to separate said non-ferrous beverage containers from said ferrous beverage containers, said plastic drum means comprising:

a hollow inner generally cylindrical portion having inner and outer surfaces:

a hollow outer generally cylindrical portion having inner and outer surfaces with at least a portion of said outer cylindrical portion being concentrically disposed around said inner cylindrical portion and means for coupling said inner cylindrical portion to said outer cylindrical portion for movement therewith;

means for depositing ferrous and non-ferrous beverage containers onto said outer surface of said outer cylindrical portion;

power roller means coupled to said inner cylindrical portion for inducing rotational movement in said plastic drum means to transport said non-ferrous beverage containers on said outer surface of said outer cylindrical portion of said plastic drum means said first predetermined distance;

said power roller means having an outer surface in contact with said inner surface of said inner cylindrical portion;

the longitudinal axis of said outer surface of said power roller means being coextensive with the longitudinal axis of said inner cylindrical portion; and

magnetic means disposed between said outer surface of said inner cylindrical portion and said inner surface of said outer cylindrical portion to induce a magnetic field through said outer cylindrical portion for a segment of its arc of rotation sufficient to hold said ferrous beverage containers against said outer surface of said outer cylindrical portion and cause said ferrous beverage containers to follow said rotational movement of said outer cylindrical portion said second additional predetermined distance to separate said ferrous beverage containers from said non-ferrous beverage containers.

4,557,388

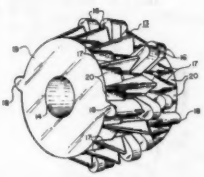
AGRICULTURAL ROLL FOR CONVEYING AND SORTING MACHINES

Soren E. Peterson, 1649 W. 3300 S., West Valley City, Utah 84119

Filed Jul. 9, 1984, Ser. No. 628,858

Int. Cl.[4] B07B *13/04*

U.S. Cl. 209—671 **7 Claims**



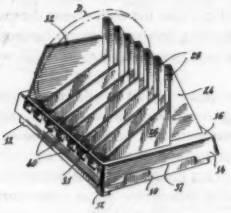
1. An elastomeric tapered roll provided with a central, axial shaft aperture; a series of longitudinally elongate, mutually-spaced sloping ribs forming a frusto-conical friction surface; plural, mutually spaced nubs extending outwardly beyond said ribs proximate the roll's largest regular circumferential dimension; and longitudinally elongate protuberance means, parallel to said shaft aperture, interpositioned between selected ones of said ribs and extending radially outwardly beyond said ribs proximate said roll'smallest regular circumferential dimension.

4,557,389

STORAGE RACK FOR FOOD PROCESSOR TOOL DISCS

James E. Williams, Stamford, and Edward R. Kozlowski, Southport, both of Conn., assignors to Cuisinarts, Inc., Greenwich, Conn.

Filed May 13, 1983, Ser. No. 494,181
Int. Cl.[4] A47F 7/00
U.S. Cl. 211—13 **11 Claims**



1. A rack for storing a plurality of generally disc-shaped food processing tools, each having a hub receptacle mounted on the lower side for removably mounting the disc tool on an elongated hub during usage of the disc tool, said rack comprising:

a base defining a plurality of parallel, substantially horizontal slots therein;

a vertical wall extending upwardly from said base along each of said slots and including (a) a first wall portion adjacent said slot and extending from a first end of said slot to a location intermediate the ends of said slot, (b) a second wall portion parallel to, but spaced in an offset relationship away from said slot and extending from said intermediate location to the second end of said slot, and (c) a third wall protion joining said first and second wall portions at said intermediate location, said third wall portion being perpendicular to said first and second wall portions, and

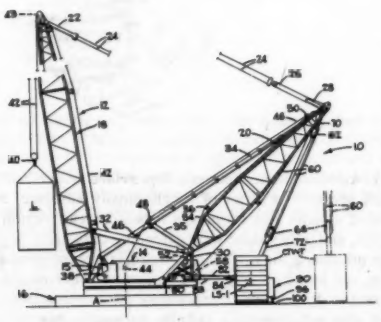
the dimensions of each slot being such as to receive a food processing disc tool inserted therein with the disc tool oriented in a generally vertical plane and the space between each slot and its associated second offset wall portion being sufficient to receive the hub receptacle of the inserted disc tool.

4,557,390

SUSPENDED COUNTERWEIGHT CONTROL SYSTEM

Jon L. Mick, Cedar Rapids, Iowa, assignor to FMC Corporation, Chicago, Ill.

Filed Sep. 1, 1983, Ser. No. 528,685
Int. Cl.[4] B66C 23/76, 13/06
U.S. Cl. 212—197 **1 Claim**



1. An apparatus for maintaining the stability of a suspended counterweight and crane or the like which includes an upper works having a longitudinal axis lying in a vertical plane, a lower works, means for supporting said upper works on said lower works for pivotal movement about a vertical axis, a boom mounted for pivotal movement about a horizontal axis on the upper works, a load, a load line suspending said load from the boom, a mast mounted for pivotal movement about a second horizontal axis on said upper works, a counterweight, a counterweight hoist line suspending said counterweight from said mast, said suspended load and counterweight normally lying in said vertical plane, and means connecting the upper end of the mast to the upper end of the boom; the improvement which comprises:

means for pivoting the boom about its horizontal axis for varying the horizontal distance of the load from said vertical axis; and

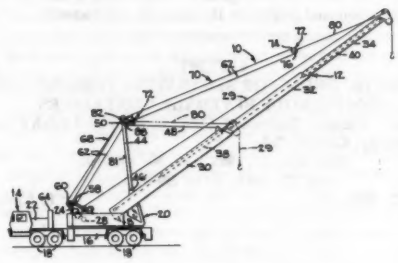
means for simultaneously applying equal substantially horizontal diagonal counterweight pulling forces from opposite sides of the longitudinal axis of the upper works for maintaining the suspended counterweight substantially centered on said longitudinal axis and for controlling movement of the counterweight a sufficient amount toward or away from said vertical axis for maintaining the load within an acceptable balance range, said counterweight being suspended above a crane supporting surface and said counterweight hoist line being angled inwardly and downwardly toward said vertical axis when the crane is in operation.

4,557,391

METHOD OF CONTROLLING THE ANGLE OF A PIVOTAL BOOM WITH EXTENSIBLE SECTIONS

Darwin N. Poock, Cedar Rapids, and Robert A. Rathe, Hiawatha, both of Iowa, assignors to FMC Corporation, Chicago, Ill.

Division of Ser. No. 393,986, Jun. 30, 1982. This application Oct. 25, 1984, Ser. No. 648,110
Int. Cl.[4] B66C 23/82, 23/42
U.S. Cl. 212—270 **8 Claims**



1. A method of controlling the working angles of a pivotally supported extensible boom and the mast-boom angle between a lowered transport position and a predetermined raised mast-boom working angle; said boom including a base section and an extensible section movable along a longitudinal axis, a first fixed length pendant between the mast and a non-extensible portion of the boom to establish said mast-boom working angle; said angles being changed by movement of a rope trained around a winch, a boom supporting hoist, and a pendant take-up hoist that includes a multi-groove floating sheave assembly; a second fixed length pendant connected between the telescopic boom section and the floating sheave assembly; and a floating sheave stop means pivotally connected to said mast; when said boom is fully retracted and said mast and boom are in their transport positions, said method comprising the steps of maintaining a portion of said floating sheave assembly cradled within and in firm abutting contact with a recess in the sheave stop, raising the mast to pull said second fixed

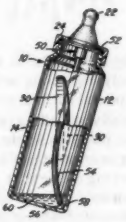
length pendant taut and to pay out sufficient rope from the pendant take-up winch for establishing said boom angle by pulling said first pendant taut and moving said portion of said floating sheave out of abutting contact with said stop thereby maintaining complete control of said mast during movement from its transport position to its working position.

4,557,392

BABY BOTTLE WITH HANDLES

Kathryn A. Ryan, and Gregory F. Ryan, both of 77 Erie St., Dumont, N.J. 07628

Filed May 14, 1984, Ser. No. 610,256
Int. Cl.[4] A61J *9/00*; F16K *21/00*
U.S. Cl. 215—11 R **7 Claims**



1. In a baby bottle having a body with a tubular side wall extending longitudinally between a mouth at the top end thereof and a bottom wall at the bottom end thereof, the bottom wall intersecting the side wall at a corner, the baby bottle having a central longitudinal axis, the mouth being adapted to receive a nipple and a dip-tube accessory including a dip-tube having an entrance end to be located at said corner when the dip-tube accessory is in place at the mouth of the baby bottle to assist in draining the contents of the bottle, the improvement comprising:

at least two handles integral with the tubular side wall, the handles projecting laterally outwardly in generally opposite directions from the longitudinal axis, the handles each having opposite first and second ends and a length extending generally longitudinally along the body, between said opposite first and second ends;

each handle being tapered toward each of the opposite ends and gradually faired into said side wall, the handles each having a concave surface and a convex surface establishing a handgrip portion for a baby's hand, the handgrip portion being spaced laterally a distance from the side wall, and a web portion spanning the distance between the handgrip portion and the side wall for precluding catching of the fingers of the baby's hand between the handgrip portion and the side wall, the web portion of each handle including smooth continuous surfaces contiguous with the side wall and the handgrip portion of that handle, each web portion extending continuously between the handgrip portion and the side wall throughout the length of the corresponding handle;

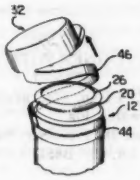
the handles each extending at an acute angle to the longitudinal axis, with the concave surface tilted toward confrontation with the bottom end of the side wall diametrically opposite said corner, such that upon orientation of the handles in a vertical direction the central longitudinal axis of the body bottle will be tilted at said acute angle to tilt the nipple at said acute angle and to direct the contents of the baby bottle toward the entrance end of the dip-tube located at said corner.

4,557,393

SNAP-ON CAP WITH TETHERING STRAP

Elmer Boik, Lombard, Ill., assignor to Continental White Cap, Inc., Northbrook, Ill.

Filed Apr. 17, 1984, Ser. No. 601,210
Int. Cl.[4] B65D *49/12*
U.S. Cl. 215—253 **5 Claims**



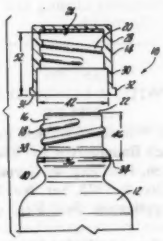
1. A tethered closure comprising a cap portion and a tethering portion, said cap portion including an end panel and an integral depending skirt, said tethering portion being in the form of an extension of said skirt and including a lower anchoring band, a weakening line in said skirt extension defining a tethering strap between said skirt and said anchoring band, opposite ends of said tethering strap being permanently attached to both said skirt and said anchoring band, said cap portion being of the lift-off type and having a lift flange disposed remote from the permanent connection between said skirt and said tethering strap, said weakening line including first and second portions lying in spaced parallel planes, and an intermediate portion extending between said planes, the connection between said tethering strap and said anchoring band being in the form of a hinge lying in that one of said parallel planes lying adjacent said anchoring band and being at one end of said weakening line, said hinge being formed by a weakening area.

4,557,394

LOCK ARRANGEMENT FOR CLOSURES

Edward Luker, 5812 Twickingham Ct., Evansville, Ind. 47711

Filed Jul. 23, 1984, Ser. No. 633,289
Int. Cl.[4] B65D *41/04*
U.S. Cl. 215—317 **16 Claims**



1. A lock arrangement for a closure and container comprising: a container having a threaded neck, an annular flange portion disposed below said threaded neck, a closure having a cylindrical skirt with an upper portion containing threads complementary to the threads on said neck and a lower thinner cylindrical skirt portion extending below said flange portion when said threads are engaged and said closure is in a closed condition on said container, said lower cylindrical skirt portion having a diameter less than the diameter of said radially extending flange portion on said neck, said lower skirt portion being deflectable outwardly temporarily upon threaded application of said closure on said container to a closed position, said cap being made of a resilient material having a good mem-

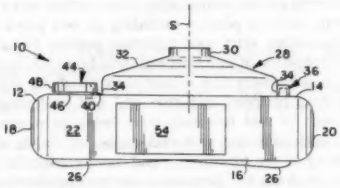
ory but being substantially permanently deformable under load over a long period of time whereby said lower skirt portion below said flange portion returns towards its original as molded position after closing of said container while said flange maintains the adjacent portion of said lower skirt portion extended radially outward to form an undercut skirt portion resisting axial opening displacement and rotational movement of said closure relative to said container.

4,557,395

PORTABLE CONTAINER WITH INTERLOCKING FUNNEL

Victor A. DeLay, Jr., Largo, Fla., assignor to E-Z Out Container Corp., Clearwater, Fla.

Filed Mar. 28, 1985, Ser. No. 717,439
Int. Cl.[4] B65D *3/04*
U.S. Cl. 220—86 R **20 Claims**



1. A container of the type having a small fill spout and having increased utility when used in conjunction with a funnel, comprising:

a container body member of generally parallelepiped configuration,

a fill spout formed in a top wall of said container body member and projecting upwardly therefrom,

a vent means in the form of an aperture formed in said top wall,

a funnel member having a rim, converging sidewalls, and a downspout,

said fill spout and funnel downspout adapted for releasable engagement with one another,

a vent closure member secured to said funnel rim and projecting outwardly therefrom,

said vent closure member closing said vent when brought into registration therewith.

4,557,396

LID BUTTON WITH A CONTROLLABLE STEAM OUTLET

Gerd D. Baumgarten, Wilnsdorf-Wilden, Fed. Rep. of Germany, assignor to Heinrich Baumgarten KG Eisen- und Blechwarenfabrik, Neunkirchen, Fed. Rep. of Germany

Filed Dec. 9, 1983, Ser. No. 560,088
Claims priority, application Fed. Rep. of Germany, Dec. 9, 1982, 8234578[U]
Int. Cl.[4] B65D *51/16*
U.S. Cl. 220—206 **19 Claims**

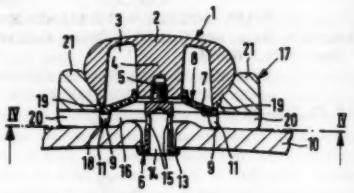
8. A lid button for a utensil lid, comprising:

a fastening element having a first portion which engages one side of said lid, having a second portion which extends through an opening provided in said lid, and having means defining a first channel therein which provides fluid communication between opposite sides of said lid;

a handle part which is separate from said fastening element and is disposed on a side of said lid opposite said one side thereof, said handle part being spaced from said lid and being fixedly secured to an end of said second portion of said fastening element;

an annular blocking element which is separate from said fastening element and said handle part, said blocking element encircling said second portion of said fastening element and being firmly clamped between said handle part and said lid, said fastening element, said handle part and said blocking element being fixed against rotation with respect to each other and with respect to said lid, said blocking element having thereon a radially outwardly facing peripheral surface and having means defining a second channel which extends thereinto from said peripheral surface and is in fluid communication with said first channel in said fastening element; and

an annular collar which is separate from said fastening ele-



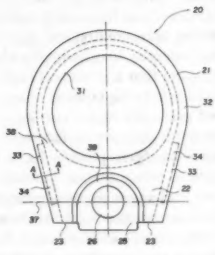
ment, said blocking element and said handle part, said annular collar closely encircling and being rotatably supported on said peripheral surface of said blocking element and having a generally radially extending opening therethrough, said collar being movable between a position in which said opening is angularly aligned with said second channel in said blocking element and facilitates fluid communication between said second channel and a location external to said lid button and a position in which said collar obstructs fluid flow through said second channel in said blocking element.

4,557,397

PULL TAB FOR READILY OPENABLE CAN LID

Shigeaki Yamanashi, Kanagawa, Japan, assignor to Toyo Seikan Kaisha, Ltd., Japan

Filed Dec. 27, 1984, Ser. No. 686,885
Claims priority, application Japan, Jul. 24, 1984, 59-112009
Int. Cl.[4] B65D *17/34*
U.S. Cl. 220—270 **4 Claims**



1. In a pull tab for a readily openable can lid integrally comprising a panel portion having a rivet hole, leg portions on the opposite sides of said panel portion and a ring portion contiguous to the ends of said leg portions and remote from said panel portion, said ring portion including an inner peripheral fold-up and an outer peripheral fold-up and said leg portions including outer side edge fold-ups contiguous to said outer peripheral fold-up on the ring portion such as to cover the severed edges of the pull tab and impart rigidity to the pull tab, characterized by reinforcing fold-ups contiguous to the extreme edges of said side edge fold-ups on the leg portions and extending from a line connecting the center of said rivet hole and said side edge fold-ups on the leg portions to a position adjacent to the point where said inner peripheral fold-up

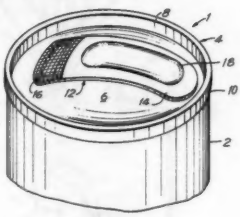
on the ring portion diverages from said outer side edge fold-ups on the leg portions.

4,557,398

END CLOSURE STRUCTURE FOR A CONTAINER

Thomas P. Hambleton, Pine Bush, N.Y.; Erick Guevara, Huntingdon Valley, Pa., and Peter Rychiger, Steffisburg, Switzerland, assignors to International Paper Company, New York, N.Y.

Filed Aug. 17, 1984, Ser. No. 642,054
Int. Cl.[4] B65D *17/34*
U.S. Cl. 220—270 **19 Claims**



1. An end closure structure for a container comprising:

a flexible central member having an outwardly dished center section and at least one opening structure disposed in said central member;

a removable flexible closure member disposed over said opening structure and said closure member is in a first sealing relationship with a portion of said opening structure and a second sealing relationship with a top surface of said central member; and

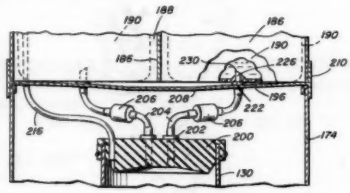
means disposed from a peripheral edge of said central member for sealing said end closure structure to an open end of said container.

4,557,399

ADAPTER FOR BOTTLED WATER DISPENSER

Richard W. Redick, Jr., 612 Oak Haven Dr., Falls Church, Va. 22046

Division of Ser. No. 117,840, Jan. 30, 1980, Pat. No. 4,341,325. This application Jul. 2, 1982, Ser. No. 394,793
Int. Cl.[4] B67B *7/24*; B67D *1/16*
U.S. Cl. 222—83.5 **4 Claims**



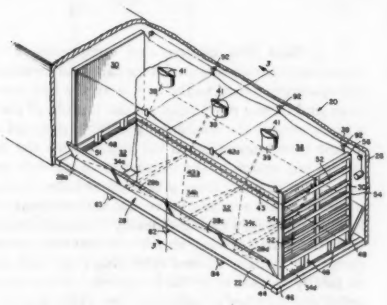
1. In combination, a liquid dispenser having a reservoir and discharge spigot means communicating therewith, at least one disposable liquid supply container, a support structure supporting the container at an elevation above the reservoir, reservoir closure means for sealing the reservoir against entry of ambient air, and means communicating the reservoir with the container for enabling gravity flow of liquid from the container to the reservoir through the closure means without the liquid coming into contact with ambient air, said closure means for the reservoir including a resilient stopper telescoped into an opening in the top of the reservoir and secured in sealed relation thereto, said means communicating the reservoir with the container including a tube having one end communicating with the reservoir through said stopper in sealed relation thereto, the other end of said tube having an end fitting communicating with the interior of the container in sealed relation thereto, said support structure including an upwardly opening recess to enable unrestricted insertion and removal of the container in relation to the recess with the weight of the container and liquid retaining the container in the recess and retaining the end fitting and container in sealed relationship, said support structure including a vertically disposed housing receiving the container with the housing including a bottom panel, said end fitting on the tube being rigidly affixed to the bottom panel and extending therethrough with the fitting including a pointed upper end for penetrating through the bottom of the container when the container is moved downwardly into a position adjacent the bottom panel, said fitting having a lower end extending below the bottom panel and sealingly connected to the tube, said end fitting being sealed to the bottom panel so that any leakage will be retained on the upper surface of the bottom panel, said bottom panel being slanted and provided with a drain to remove any leaked liquid, the upper end of the end fitting including a beveled end terminating in a pointed tip having a metallic cutting edge associated therewith for forming an aperture in the bottom of the container when it is lowered toward the bottom panel.

4,557,400

CONVERTIBLE CARGO CARRIER FOR TRAILERS AND THE LIKE

Edwin E. Clarke, Allentown, Pa., assignor to Converta-Vans, Inc., Allentown, Pa.

Filed Dec. 30, 1982, Ser. No. 454,881
Int. Cl.[4] B60P *1/56*; B61D *3/06, 7/32, 17/18*
U.S. Cl. 222—105 **38 Claims**



1. A cargo carrier unit adapted to be converted into a bulk material carrier comprising:

a container having a floor and two parallel substantially vertical walls,

said floor including at least one floor panel movable between a storage position and an operative position elevated relative to said storage position and at least one floor section movable between a storage position and and an operative position elevated relative to said storage position,

said floor panel when in said operative position and said floor section when in said operative position cooperating with portions of said walls to define a bulk compartment,

said floor panel being positioned above said floor section when said floor panel and said floor section are in said storage positions,

said floor panel when in said operative position and said floor section when in said operative position forming an opening in said floor,

said floor panel when in said operative position providing a surface inclined toward said opening,

each said floor section when in said operative position being

generally adjacent said opening and perpendicular to said walls, and

a flexible liner mountable in said bulk compartment when said floor panel and said floor section are in said operative positions,

said flexible liner defining a liner compartment for holding bulk material when mounted in said bulk compartment,

said flexible liner including an inlet means for charging bulk materials into said liner compartment and an outlet means cooperable with said opening for communicating the interior of said liner compartment with the exterior of said bulk compartment.

4,557,401

FLUID CONTAINER SAFETY VALVE

John G. Hodge, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Division of Ser. No. 324,161, Nov. 23, 1981, abandoned. This application Dec. 1, 1983, Ser. No. 557,078

Int. Cl.⁴ B65D *37/00*

U.S. Cl. 222—211 **2 Claims**

1. A fluid flow control unit comprising: a squeeze type dispensing container; a container cap; a tube extending through and sealingly joined to the cap, with the tube having a length to extend from a point adjacent the bottom of the container to a point outside the container; a housing one end of which has a hole communicating to the inside with the hole sized to accept and attach to the inside end of the tube and the other end of the housing have a tapered radially inward extending projection that acts as a valve seat and terminates in an axially located opening; a casing slideably mounted inside the housng, with the casing having lengthwise grooves around the outer periphery, radially inward extending ends each terminating in an axially located hole, the lower end on the outside having a valve seal member to mate with the valve seat on the housing and the upper end tapered on the inside to make a valve seat; a resilient member continually urging the casing with valve seal against the valve seat; a tubular member slideably mounted inside the casing, with the tubular member having lengthwise grooves on the outer periphery, open ended at the lower end and closed at the upper end with the upper end having a valve seal on the outside; and a resilient member continually urging the tubular member valve seal against the valve seat on the casing to in combination form a fluid control unit dispensing fluid in response to pressure on the flexible container and returning fluid and air into the container upon releasing the pressure.

4,557,402

HOPPER FEED MECHANISM

Albert I. Morse, Beverly, Mass., assignor to USM Corporation, Farmington, Conn.

Filed Dec. 15, 1983, Ser. No. 561,835

Int. Cl.⁴ B65D *88/66*

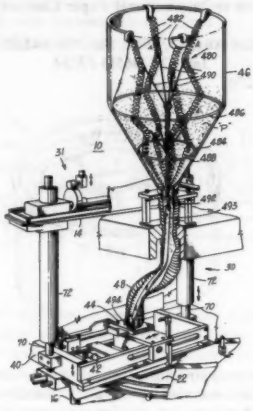
U.S. Cl. 222—230 **4 Claims**

1. A hopper feed apparatus for the supply system of a powder reinforcing machine, comprising:

a hopper supply arranged on a frame portion of the machine;

a flexible conduit disposed between said hopper and a movable dispersal carriage of said machine, and

a powder displacement means arranged within said hopper and said flexible conduit, which means responds to normal movement of said dispersal carriage to maintain the powder in said hopper and conduit in a free flowing condition;



said powder displacement means comprising an arrangement of springs attached to said hopper, which are biasable for biasing means within said conduit, comprising a line to said springs, said line being attached at its upper end to a common juncture of the lower ends of said springs in said hopper.

4,557,403

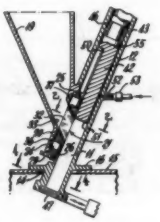
DRY FEEDER FOR FINELY DIVIDED SOLIDS INTO HIGH PRESSURE ATMOSPHERE

John S. Stevenson, Los Angeles, Calif., assignor to Texaco Inc., White Plains, N.Y.

Filed Apr. 13, 1984, Ser. No. 600,275

Int. Cl.⁴ G01F *11/24*

U.S. Cl. 222—252 **10 Claims**



1. A dry feeder for finely divided solids into a high pressure atmosphere, comprising

a cylindrical load chamber for receiving a charge of said solids,

chute means for delivering said solids by gravity flow at atmospheric pressure to said load chamber,

first valve means for controlling said atmospheric pressure delivery including seal means to withstand said high pressure,

means for pressurizing said load chamber,

means for orienting said load chamber for permitting gravity flow discharge into said high pressure atmosphere,

second valve means for controlling said high pressure gravity discharge, and

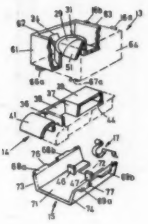
an elongated piston for displacing said high pressure atmosphere from said load chamber after said high pressure gravity discharge.

4,557,404

METERING AND DISPENSING UNIT

Arieh Solomon, Tel Aviv, Israel, assignor to Damar Holdings B.V., Rotterdam, Netherlands

Filed Nov. 8, 1982, Ser. No. 439,782
Claims priority, application Israel, Nov. 9, 1981, 64246
Int. Cl.⁴ G01F *11/18*
U.S. Cl. 222—325 **5 Claims**



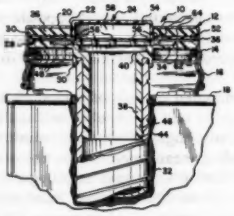
1. A metering an dispensing unit for dispensing metered quantities of granular material from a container comprising a body having upstanding walls for holding the container and a central port to engage in and seal with the mouth of the container, a separately formed drawer which fits below the body and includes a metering compartment for receiving the granular material through the central port when the drawer is closed and arranged to discharge a metered quantity of granular material when the drawer unit is opened, the drawer being provided with a closure wall to close off the port when the drawer is open, and a separately formed track unit extending around the drawer having means to engage with and to connect the track unit to the body so as to hold the drawer in close sliding co-operation with the body and the track unit, the body being provided with discontinuous channels at each side of its lower surface and the track unit being provided with co-operating discontinuous flanges which enable the flanges to be inserted between the channels and slid into position to assemble the track unit to the body, and to allow disassembly of the track unit from the body after a period of use.

4,557,405

REVERSIBLE CLOSURE-SPOUT ASSEMBLY

Ronald L. Foust, Delphos, Ohio, assignor to The Dyson-Kissner-Moran Corporation, New York, N.Y.

Filed Apr. 15, 1983, Ser. No. 485,348
Int. Cl.⁴ B67D *3/00*
U.S. Cl. 222—539 **3 Claims**



1. In a reversible closure-spout assembly including a closure cap having a cylindrical side wall threaded for engagement with a complementarily threaded collar of a fluid container and a top portion having a central hole therethrough and a spout assembly having a tubular spout adapted to extend through said opening when said spout assembly is in a pouring cofiguration, the improvement comprising:

said spout assembly consisting of spaced apart molded plastic members integrally interconnected at their peripheries and defining a hollow plastic chamber and a molded plastic cylindrical tube formed integrally with said hollow plastic chamber,

said integrally formed molded plastic tube having an outer diameter substantially less than the diameter of said central hole through said closure cap,

said molded plastic tube being received in an interference fit within said tubular spout and thereby defining a fluid-tight connection between said tubular spout and said spout assembly consisting of said hollow plastic chamber and said integrally formed molded plastic tube, and

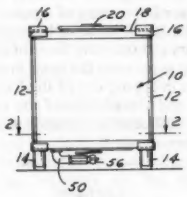
a molded plastic annular rib formed integrally with said hollow plastic chamber and projecting concentrically with said plastic tube molded integrally therewith and receiving said tubular spout.

4,557,406

STORAGE AND SHIPPING BIN

Dean E. Olinger, Clarkston, and Robert A. Harding, Holly, both of Mich., assignors to Clawson Tank Company, Clarkston, Mich.

Filed Jan. 23, 1984, Ser. No. 573,284
Int. Cl.⁴ B65D *25/40*
U.S. Cl. 222—564 **1 Claim**



1. In a large bulky container for liquid storage and shipping having a square cross-section with a bottom wall, side walls and a top closure, that improvement which comprises a relatively flat bottom wall having a depressed sump centrally of the bottom at an intersection of straight lines connecting opposite corners of the container, depressed channels on each of said intersecting lines extending from adjacent each corner to the central sump, three of said channels having bottom walls increasing in depth from the corner to the sump, the fourth channel increasing in depth from said sump to a drain opening adjacent one corner of the tank, wherein material may be pumped from said sump to empty the container except for a residual quantity which can be removed through said drain opening.

4,557,407

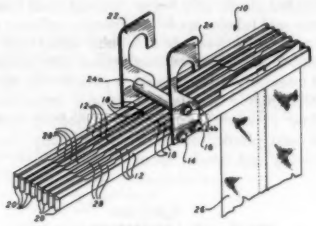
PANTS HANGER

Stanley H. Bogaczyk, P.O. Box 276, Rochelle Park, N.J. 07662

Continuation-in-part of Ser. No. 342,345, Jan. 25, 1982, abandoned. This application Aug. 6, 1984, Ser. No. 638,525
Int. Cl.⁴ A47J *51/14*
U.S. Cl. 223—96 **4 Claims**

1. A multiple pants hanger for supporting a plurality of pairs of pants on a clothing bar, comprising a pair of rod hooks, a plurality of horizontally extending parallel bars between said rod hooks and each bar having a rectangular cross-section, and flat vertical faces, spacers located between the bars for spacing the bars apart, said bars being spaced from each other so that

pants receiving slots are formed therebetween to hold the pants in an upside down position by uniform pressure on the pants leg across the entire width of the pants leg, each of said slots being of equal width from top to bottom so that each vertical face is fully and completely in frictional contact over the entire vertical surface thereof with the pants leg retained therebetween, means for securing said bars together with the outer end of said bars being free and unconnected so that the slots are open at the outer ends of said bars, each bar being thicker at its outer end than at its inner portion so that said slots between neighboring bars are of less thickness at the outer ends thereof than at the inner ends thereof so as to completely equalize the bearing presssure of the vertical faces formed by a



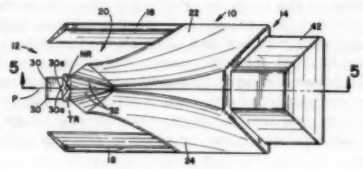
pair of adjacent bars upon the whole portion of the pants inserted in the slot between said faces along the length of said slot, a recess provided on a side of one bar between neighboring bars and between the inner end of the bar and the relatively wider outer end of the bar at a location extending from about the mid-point of the length of the slots to provide for the additional thickness of the seams of a pair of pants retained in one of said slots, the frictional force between the vertical faces of the adjoining bars and the outer faces of the pants legs, being sufficiently large so as to retain the pants in place in the slot and prevent them from dropping out of the hanger, the weight of said pants hanger and the contact of the rod hooks with the clothing bar being sufficient to maintain said hanger in a horizontal position when at rest.

4,557,408

NEEDLE THREADING DEVICES

Arnoldus Biemans, Mathenesserlaan 432, 3023 Hg Rotterdam, Netherlands

Filed Jul. 25, 1984, Ser. No. 634,224
Int. Cl.⁴ D05B *87/02*
U.S. Cl. 223—99 **28 Claims**



1. A needle threading device comprising, housing means, needle threading member means supported in said housing means for displacement in opposite directions along a path relative to said housing means, means to displace said member means in opposite directions, needle positioning means on said housing means removably receiving a needle to be threaded, thread positioning means on said housing means, said needle positioning means and said thread positioning means being operable respectively to position the eye of a needle and a thread in alignment with said path for said member means to displace a portion of said thread through said eye from one side of said needle to the other when said member means is displaced in one of said opposite directions, and means on said housing means adjacent said other side of said needle for engaging and holding said portion of said thread against displacement relative to said housing means when said needle is removed from said needle positioning means.

4,557,409

ELECTRICAL GROUNDING ROD DRIVING DEVICE

J. Edwin Hecock, Wauseon, and James O. Mumper, Tiffin, both of Ohio, assignors to E & J Demark, Inc., Wauseon, Ohio

Filed Mar. 19, 1984, Ser. No. 591,311
Int. Cl.⁴ B25C *1/02*; B25D *9/00*
U.S. Cl. 227—147 **1 Claim**

1. An electrical grounding rod driving device comprising an elongated cylinder having a hammer secured within each end portion and encompassing a ground rod receiving and driving shaft having a single anvil affixed to one end thereof within said cylinder and having opposing striking surfaces for selective engagement by the striking face of either hammer, the driving shaft having a recess in each end for selective engagement of one end of said rod, and means to lock said cylinder and said shaft in non-operable position.

4,557,410

STAPLER MECHANISM POWERING MEANS

Chester D. Holden, Boulder, and Allan J. Rood, Longmont, both of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 30, 1983, Ser. No. 527,725
Int. Cl.⁴ B25C *7/00*; B21J *15/28*
U.S. Cl. 227—155 **2 Claims**

1. A compact apparatus for driving and clinching a staple, comprising:

a stapler mechanism for driving a staple through articles to be stapled;

a clincher mechanism associated with said stapler mechanism and operable to clinch a staple which has been driven through the articles to be stapled;

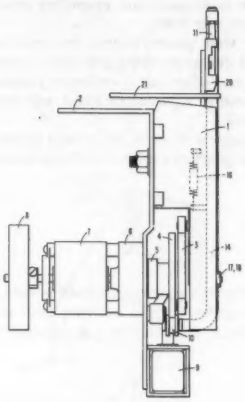
a rotary motor including a rotary output shaft having two opposite ends extending out of opposite sides of said motor, said motor being adapted to be energized for a period of time exceeding the time necessary to drive and clinch a staple;

a flywheel mounted on one of said shaft ends, to thereby store energy in said flywheel as said shaft rotates;

an intermittently engaged single revolution clutch having input coupling means mounted on the other of said shaft ends, and having an output coupling means, said clutch being operable to deliver torque from said input coupling means to said output coupling means, for a single revolution of said clutch, when said clutch is engaged;

a rotary-to-linear converter having a rotary-movement input

connected to the output coupling means of said clutch, having a first linear-movement output coupled to said stapler mechanism, and having a second linear-movement output coupled to said clincher mechanism, to thereby drive and clinch a staple during one revolution of said clutch; and

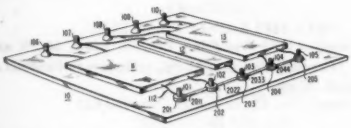


means for momentarily engaging said clutch, said flywheel thereafter being operable to deliver energy to the output coupling means of said clutch during the one revolution of said clutch, as a staple is driven and clinched.

4,557,411
INTERCONNECTED SOLDER PADS AND THE METHOD OF SOLDERING

Robert J. Farquharson, Atlantic Highlands, and Stanton T. Gerns, Cedar Knolls, both of N.J., assignors to AT&T Information Systems, Holmdel and AT&T Bell Laboratories, Murray Hill, both of, N.J.

Filed Oct. 26, 1983, Ser. No. 545,470
Int. Cl.[4] B23K *35/14*
U.S. Cl. 228—56.3 **5 Claims**



1. A solder structure comprising a plurality of solder pads interconnected by a link of solder and wherein each said link separates from said pads upon the application of heat, and wherein each said link is constructed having a variable volume of solder dependent upon the volume of solder necessary at the associated pad.

3. A method of manufacturing solder pad assemblies, said method comprising the steps of

selecting a sheet of solder,

applying a photo sensitive etchant resist to both surfaces of said selected sheet,

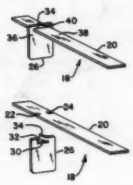
applying, by standard printed circuit techniques, a photo pattern of pads to said selected sheet over said etched resist, and

etching the solder sheet to form a series of interconnected pads by using an etching material.

4,557,412
INTERSECTING FEATHER SEALS AND CONSTRUCTION THEREOF

Herbert J. Lillibridge, Plainville, and Russell A. Schwarzmann, Marlborough, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Division of Ser. No. 558,401, Dec. 5, 1983, Pat. No. 4,524,980.
This application Jul. 18, 1984, Ser. No. 632,097
Int. Cl.[4] F16J *15/08*
U.S. Cl. 228—155 **3 Claims**



1. The method of fabricating an interlocking feather seal consisting of a pair of flat metallic plate members in angular relationship relative to each other comprising the steps of:

(a) broaching diametrically opposed slots into one of said flat metallic plate members

(b) broaching an aperture at one end of the other of said flat metallic plate members

(c) cutting a slit in the piece mentioned in the above step to intersect an edge of said aperture

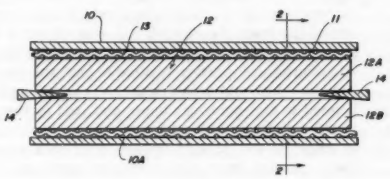
(d) bending the end of the piece slit in the above-mentioned step and

(e) fitting said aperture into the diametrically opposed slots, joining the bent portion after retaining it to its original position.

4,557,413
HEAT PIPE FABRICATION

Wallace J. Lewis, and David R. Bolser, both of Florissant, Mo., assignors to McDonnell Douglas, St. Louis, Mo.

Filed Apr. 11, 1984, Ser. No. 598,714
Int. Cl.[4] B23K *31/02*
U.S. Cl. 228—183 **14 Claims**



1. A method of joining a stainless steel screen wick to a titanium heat pipe tube, the method comprising the steps of:

(a) removing contaminants from the surface of both the titanium tube component and stainless steel screen wick component;

(b) disposing the stainless steel screen wick component against a surface of the titanium tube component to provide point contact therebetween;

(c) holding the stainless steel screen wick component in intimate contact with a surface of the titanium tube component;

(d) bringing the asembled titanium tube and stainless steel screen wick components in an inert atmosphere up to a temperature within a range which varies between 1800° F. and 1950° F.; and

(e) maintaining the temperature within said range for substantially 15 minutes to obtain eutectic bonding of the

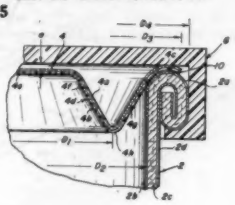
stainless steel screen wick component to said titanium tube component.

4,557,414

MEMBRANE-TYPE END CLOSURE MEMBER

James A. Ford, Winchester, Mass.; Gerald F. Staack, Chesterfield, Mo., and Phillip Waite, Cempston, England, assignors to Boise Cascade Corporation, Boise, Id.

Filed Jul. 14, 1981, Ser. No. 283,171
Int. Cl.⁴ B65D *3/12, 5/64*
U.S. Cl. 229—5.5 **13 Claims**



1. A container including a membrane-type closure member, comprising:

(a) a tubular container member which is open at its upper end; and

(b) end closure means closing said container upper end, said end closure means including a horizontal generally resilient peelable membrane-type closure member formed from a sheet of relatively thin flexible material, said closure member including

(1) an annular flange portion bonded to the upper extremity of said container upper end;

(2) a horizontal circular central disk portion; and

(3) an annular downwardly deformed trough portion connected between the peripheral edge of said disk portion and the inner peripheral edge of said annular portion, said trough portion having a downwardly and inwardly converging outer side wall, the diameter of the lowermost extremity of said outer side wall being less than the internal diameter of said container member, thereby to cause the lower portion of said outer side wall to be spaced inwardly from the inner wall surface of said container member, whereby said annular deformed trough portion assists in aligning the members during the assembly thereof, and also affords a limited degree of flexure permitting vertical displacement of said central disk portion relative to said annular flange portion when said membrane-type closure member is bonded to said container upper end, and further structurally reinforces said membrane-type closure member to improve the peeling operation of said peripheral flange portion from said container upper end and to preclude tearing of said membrane-type closure while peeling and the integrity of said closure member is maintained.

4,557,415

ICE CREAM CARTON

William H. Carr, Jr., Ashland, Ohio, and John D. Desmond, Philadelphia, Pa., assignors to Container Corporation of America, Chicago, Ill.

Filed Jan. 30, 1985, Ser. No. 696,391
Int. Cl.⁴ B65D *5/20*
U.S. Cl. 229—30 **14 Claims**

1. An open top, liquid tight carton having a flat bottom wall and having flat side and end walls joined to each other by rounded corners, said carton being formed from a unitary blank of foldable sheet material such as coated paperboard and comprising:

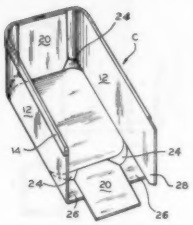
(a) a bottom wall panel having pairs of opposed, parallel, straight side and end edges joined by rounded corner edges;

(b) a pair of opposed end wall inner panels foldably joined to and upstanding from opposite end edges of said bottom wall panel;

(c) a pair of opposed side wall panels having center portions foldably joined at lower edges to respective side edges of said bottom wall panel and extending upwarding therefrom to form side walls;

(d) said side wall panels having end portions extending beyond said center portions, over said bottom wall panel corner and end edges, into overlapping relation with each other, outwardly adjacent said end wall inner panels, to form end walls;

(e) a pair of gussets at each end of said carton joining said bottom wall panel to a related end wall inner panel and to



said side wall panel end portions to provide a liquid tight bottom corner construction;

(f) each of said gussets including:

(i) a generally triangular first section foldably joined to said bottom wall panel along a related rounded corner edge of said bottom wall panel and foldably joined to said inner end wall panel along a fold line extending upwardly from said bottom wall panel;

(ii) a second gusset section foldably joined to a related side wall panel end portion on a fold line which is an extension of a fold line joining said side wall panel center portion to said bottom wall panel and being free from attachment to the related end wall inner panel;

(iii) said gusset sections being foldably joined to each other on a curved fold line which extends inwardly and upwardly from the junction of said bottom wall panel side and corner edges and is tangent to the latter.

4,557,416

MULTIPLE-UNIT MAIL BOX

Benedict J. Stahl, 12282 Woodbine, Detroit, Mich. 48239, and Thomas L. Hierman, Pickney, Mich., assignors to Benedict J. Stahl, Detroit, Mich.

Filed Oct. 15, 1984, Ser. No. 660,633
Int. Cl.⁴ B65D *91/00*
U.S. Cl. 232—24 **11 Claims**

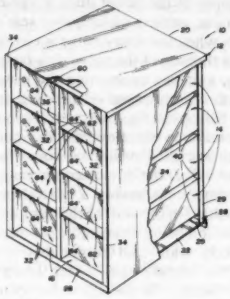
1. A multiple-unit mail box apparatus comprising:

an outer support structure having interconnected top, bottom and side panels including front and back panels, said front panel having a plurality of container openings including an aligned set of container openings;

a like plurality of tubular receptacles supported by said support structure therewithin in spaced relationship from each other between said front and back panels adjacent said container openings, each of said receptacles having a receptacle opening formed at its front end thereof to receive mail inserted therethrough, and

a hinge door assembly for selectively opening and closing said receptacle openings, said assembly including a hinge rod fixedly mounted at its opposite ends to said front panel and a set of aligned receptacle doors individually and hingedly mounted on said hinge rod at spaced locations corresponding to an aligned set of said receptacle open-

ings; wherein said front panel includes a plurality of spaced, parallel, weather strip portions formed immediately adjacent their respective container openings, said



hinge rod being fixedly mounted at its opposite ends to the outermost strip portions and extending through at least one strip portion intermediate the outermost strip portions.

4,557,417

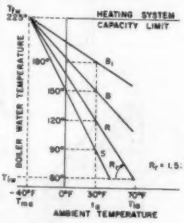
HEAT CONTROL

Ernest D. Ruby, 839 Laramie St., Glenview, Ill. 60025

Filed Nov. 27, 1984, Ser. No. 675,290

Int. Cl.[4] G05D *23/00*

U.S. Cl. 236—46 R **20 Claims**



1. A heat control for a building heating system using a heating medium for maintaining the temperature of the building at a design level during daytime operation throughout the ambient temperature range for which the heating system was designed comprising a computing circuit, said circuit connected to said heating system in such a way that it establishes a functional relationship between the temperature of the heating medium and the ambient temperature wherein the temperature of the heating medium required to maintain the temperature of the building at its design level during daytime operation generally decreases as the ambient temperature increases, and setback means in said circuit for reducing the temperature in the building at night in such a way that as the ambient temperature approaches the lowest temperature in the temperature range for which the heating system is designed, the magnitude of the temperature reduction in the building also decreases.

4,557,418

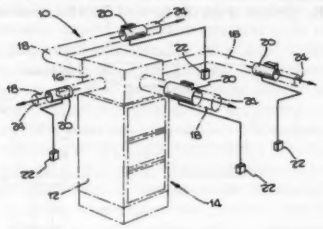
ENERGY CONSERVATION CONDITIONED AIR SYSTEM

Louis J. Leemhuis, 311 Promontory Dr. W., Newport Beach, Calif. 92660

Filed Dec. 19, 1983, Ser. No. 562,526

Int. Cl.[4] F24F *13/10*

U.S. Cl. 236—49 **15 Claims**



1. A method for conditioning and distributing a pressurized fluid from a central source to a plurality of remote spaces in an energy conserving manner which comprises:

(a) providing a source control in the central source for maintaining the conditioning of the fluid within a narrow range;

(b) providing at least one duct from said central source to each of said plurality of remote spaces;

(c) controlling the flow of said fluid through each of said ducts by a dual mode constant volume controller located in each of said ducts which selectably allows either a high or a low volume of fluid flow;

(d) providing at least one space control located in each of said plurality of remote spaces; and

(e) controlling the volume controller in the duct to a given remote space by a space control in the given remote space which selects the high volume of fluid flow when the condition in the conditioned space is outside of a desired range and selects a low volume of fluid flow when the condition in the conditioned space is within the desired range, each of said volume controllers having a vane disposed in its respective duct and held in a central position by biasing means when no fluid flows through the duct, said vane being deflected by the passage of the fluid in the duct, said vane operating a motor turning a damper to selectively open and close the duct according to the passage of fluid through the duct, a two position biasing means enhancer increasing the bias on said vane opposite the fluid flow requiring a high volume fluid flow before said vane operates said motor to close said damper when said two positon biasing means enhancer is in an advanced position determined by said given space control detecting a condition in said conditioned space outside of a desired range; and, said two position biasing means enhancer decreasing the bias on said vane opposite the fluid flow requiring a low volume fluid flow before said vane operates said motor to close said damper when said two position biasing means enhancer is in a rest position determined by said given space control detecting a condition in said conditioned space inside of a desired range.

4,557,419

TEMPERATURE-ACTUATED FLOW CONTROL DEVICE

George R. Hall, II, Wickliffe, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.

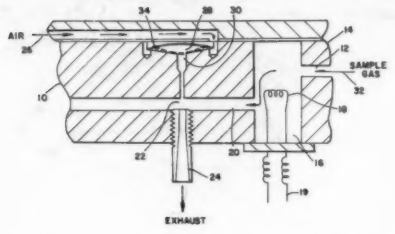
Filed Feb. 17, 1983, Ser. No. 467,554

Int. Cl.[4] G05D *23/02*

U.S. Cl. 236—93 R **4 Claims**

1. A temperature-actuated fluid flow control device comprising:

a fluid inlet;
an exhaust line for the fluid connected to said fluid inlet;
means for inducing flow of fluid into said fluid inlet and out said exhaust line;
a switching chamber located between said fluid inlet and said exhaust line;
a bi-metallic flexible element disposed in said switching chamber and being flexibly responsive to temperature change to move between a first flexed position wherein the element stops the flow of fluid between said fluid inlet

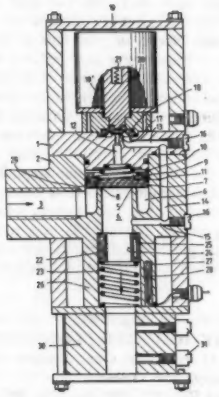


and said exhaust line and a second flexed position opening flow between said fluid inlet and said exhaust line; and
said switching chamber being larger than said bi-metallic element to make said bi-metallic element free-floating in said switching chamber and having a centrally located outlet port communicating with said fluid outlet from a tapered area substantially covered by said flexible element and inclined toward said outlet port to make said bi-metallic element self-centering with said outlet port during closure to insure the positive and repeatable closure thereof.

4,557,420
ELECTROMAGNETICALLY CONTROLLABLE SPRAY VALVE AND SPRAY SYSTEM

Marcel Boschung, Schmitten, and Walter Zehnder, St. Antoni, both of Switzerland, assignors to Boschung Mecatronic AG, Schmitten, Switzerland

Filed Sep. 2, 1983, Ser. No. 529,164
Claims priority, application Switzerland, Sep. 10, 1982, 5395/82
Int. Cl.⁴ A01G *25/02*
U.S. Cl. 239—66 **8 Claims**

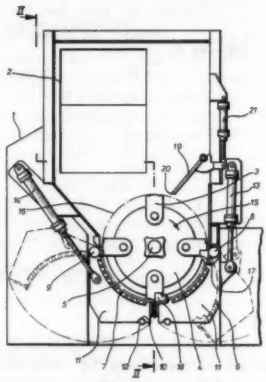


1. An electromagnetically controllable spray valve for liquids, having a valve body with a spray nozzle head, including an inlet duct and an outlet duct having an intake opening and opening into said spray nozzle head, a spring-biased valve disk formed as a piston and guided for axial movement, an annular chamber communicating with the inlet duct and surrounding the intake opening of the outlet duct, a valve seat disposed at the intake opening, against which valve seat the spring-biased valve disk rests when the spray valve is closed, a piston chamber disposed on the side of the valve disk facing away from the intake opening, a bypass connecting the piston chamber with the outlet duct, a control valve disposed in the bypass, an electromagnet for operating the control valve, and
a device responsive to the flow of the liquid, and having a switch which is closed when the liquid flows through the opened spray valve, the device comprising
a cylindrical component having a central bore, a permanent magnet embedded in the wall of the component, and a spring means, the switch being a reed contact disposed in a bore in the valve body wall, said component being displaceably disposed in the bypass, said switch being disposed in the region of the bypass, the passage cross-section of the central bore in the cylindrical component being smaller than the passage cross-section of the bypass in which the component is displaceably disposed, and the cylindrical component and the spring means being so disposed that the component moves against the return force of the spring means when a flow of the liquid occurs through the bypass in which the component is disposed.

4,557,421
PAPER DISINTEGRATOR AND METHOD OF OPERATING SAME

Karl Probst, Solingen, and Kurt Hüfken, Krefeld, both of Fed. Rep. of Germany, assignors to Lindemann Maschinenfabrik GmbH, Düsseldorf, Fed. Rep. of Germany

Filed Dec. 1, 1982, Ser. No. 445,692
Claims priority, application Fed. Rep. of Germany, Dec. 2, 1981, 3147634
Int. Cl.⁴ B02C *13/286*
U.S. Cl. 241—73 **2 Claims**



1. Paper disintegrator comprising a housing (1) having a filling opening (2), a rotor (4) rapidly rotatably journalled in said housing below said filling opening and having a horizontal rotor axis and equipped with disintegrator tools (3) having a beater circle (16) concentric with said horizontal rotor axis (5), said rotor arranged to rotate in a first direction, a discharge grating (6,7) in said housing disposed beneath the rotor (4) and a discharge opening for the housing (1) associated with the discharge grating (6,7), said rotor has a lower rotor half and the horizontal axis of said rotor is located in a vertical plane and in a horizontal plane disposed perpendicularly to the vertical plane with said lower rotor half located below and extend-

ing downwardly from the horizontal plane containing the horizontal axis of said rotor, said discharge grating substantially surrounding the lower rotor half, said discharge grating (6,7) is divided approximately in the vertical plane containing the rotor axis (5) into a first grating half and a second grating half each having a grating axis (8,9) extending parallel to the rotor axis (5) and located adjacent to the horizontal plane containing the rotor axis and spaced laterally outwardly from the vertical plane and on the opposite side thereof from the other grating axis, said first grating half located upstream from said second grating half relative to the rotation of said rotor in the first direction, means for individually and separably pivoting said first and second grating halves (6,7) laterally outwards about the grating axes (8,9), said means for pivoting can pivot the second grating half (7) between a first position adjacent to the beater circle in the range of said disintegrator tools and a second position completely out of the range of action of the disintegrator tools (3) to open a discharge path for disintegrated material coming approximately tangentially from the first grating half (6) as said rotor rotates rapidly so that a suction effect is afforded by the rapidly rotating said rotor, said means for pivoting can pivot the first grating half (6) outwardly from the beater circle for arresting said first grating half separately from said second grating half in various pivoted positions outwardly relative to and in cooperating relation with the beater circle (16) of the disintegrator tools (3),for varying the degree of disintegration of the paper and directing the disintegrated material through the discharge path formed by the second grating half in the second position, and the rotor (4) and the pivotal range of said first and second grating halves are enclosed by the housing (1) so that actuation of the grating halves (6,7) is admissible during continuous rotation of said rotor.

4,557,422

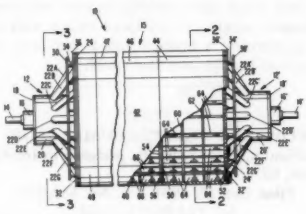
FABRICATING LARGE, THICK WALL, TUBULAR STRUCTURES

Dee R. Gill, Sandy; Edward T. Hikida, Salt Lake City, and Daniel M. Radice, Midvale, all of Utah, assignors to Hercules Incorporated, Wilmington, Del.

Division of Ser. No. 337,803, Jan. 7, 1982, Pat. No. 4,470,860. This application Aug. 5, 1983, Ser. No. 520,670

Int. Cl.[4] B65H *75/24*

U.S. Cl. 242—1 **6 Claims**



1. A mandrel for filament winding a large tubular structure, said mandrel having a horizontal central mandrel axis about which said mandrel rotates while receiving filaments that form said tubular structure, said mandrel comprising:

a hollow, cylindrical mandrel body, said mandrel body having (i) a longitudinal axis coincident with said mandrel axis, (ii) an outer cylindrical winding surface adapted for laying of said filaments and (iii) an inner mandrel body surface adapted to rigidifying and strengthening said mandrel;

first and second hub structures located at the respective ends of said mandrel body, said hub structures adapted to accept means for rotating said mandrel about said mandrel axis, said hub structures attached solely to the respective ends of said mandrel and said means for rotating attached solely to said hub structure;

said mandrel body comprising a plurality of similarly configured, annular mandrel segments fastened together along said central axis to form said mandrel body, said mandrel segments being cylindrical in form and having the same diameter as said mandrel body;

each of said mandrel segments having an inner segment surface which (i) forms said inner mandrel body surface together with inner segment surfaces of the remaining mandrel segments and (ii) bears (a) first and second fastenable ribs depending radially inward from said inner segment surface circumferentially around respective opposite ends of said mandrel segment each said fastenable rib adapted to fasten to an adjacent fastenable rib of another said mandrel segment that is adjacent said first or second fastenable rib in said mandrel body, (b) an intermediate rib depending radially inward from said inner segment surface circumferentially around a middle portion of said inner surface between said opposite ends and (c) a plurality of long rib segments extending between said first and second fastenable ribs through said radial rib, said long rib segments being spaced circumferentially around said mandrel surface and in alignment with other long rib segments of other of said mandrel segments so as to form mandrel ribs respectively extending parallel to said mandrel axis along said inner mandrel body surface said mandrel having two roll bars extending circumferentially about the horizontal central mandrel axis and spaced from the mandrel body one adjacent each of the respective ends of said mandrel body.

4,557,423

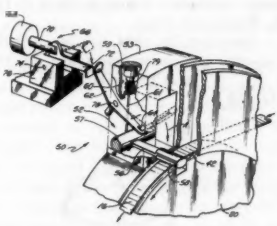
COMBINED CLAMPING AND CUTTING SYSTEM FOR MOVING FILAMENT

Christian J. Zingler, Succasunna, N.J., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Jul. 20, 1984, Ser. No. 632,895

Int. Cl.[4] B65H *54/00, 65/00, 75/28*

U.S. Cl. 242—25 R **12 Claims**



1. A clamping and cutting apparatus for utilization on an in-line filament winding device, comprising:

a winding wheel including a hub;

a combined clamping and cutting element mounted for rotation with the winding wheel, said element including a movable clamping arm having a free cutting means adjacent the surface of said hub on a side of the arm facing the direction of filament advance;

actuating means for moving said clamping arm from an open position away from the hub of the winding wheel to a closed position wherein the arm is in clamping engagement with the filament on the hub of the winding wheel so as to retain the advancing filament on the wheel; and

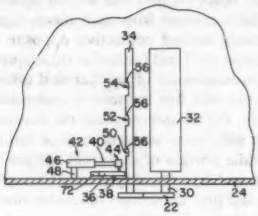
means for pulling a leading section of the filament against the cutting means as the winding wheel rotates following clamping engagement so as to cleanly remove said leading section of the filament upstream of said arm for disposal.

4,557,424

PACKAGE EJECTOR MECHANISM

Rudolf Schneeberger, Seuzach, Switzerland, assignor to Rieter Machine Works, Ltd., Winterthur, Switzerland

Filed Oct. 18, 1983, Ser. No. 543,155
Int. Cl.[4] B65H *67/00*
U.S. Cl. 242—41 **7 Claims**



1. In a filament winding machine, the combination comprising

a housing;

a chuck projecting from said housing in cantilever manner for receiving a plurality of bobbin tubes thereon;

an ejector for pushing the bobbin tubes off said chuck;

means for moving said ejector between a retracted position about said chuck and adjacent said housing and an extende position about said chuck and near an outboard end of said chuck; and

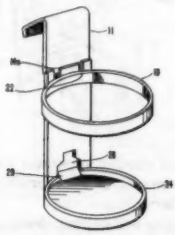
locking means for locking said ejector in at least one intermediate position between said retracted position and said extended position, said locking means including a first locking element movable with said ejector and a second locking element mounted in fixed relation to said first locking element and being selectively engageable with said first locking element to lock said ejector in said intermediate position.

4,557,425

PROBLEM-CARTRIDGE FILM PROCESSING METHOD

Koji Ichikawa, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 22, 1984, Ser. No. 623,296
Claims priority, application Japan, Jun. 24, 1983, 58-114834
Int. Cl.[4] B65H *17/20*
U.S. Cl. 242—55 **6 Claims**



1. A method for processing film cartridges, comprising the steps of:

turning a spool of a cartridge containing film to be processed in a forward direction so as to cause a leader of said film to be forwarded from said cartridge;

detecting the presence of said leader;

if said leader is not detected within a predetermined period of time after commencing turning said spool of said cartridge, turning said spool in a rewinding direction, placing retaining means around said cartridge, and forwarding said cartridge to a defective-cartridge collecting area; and

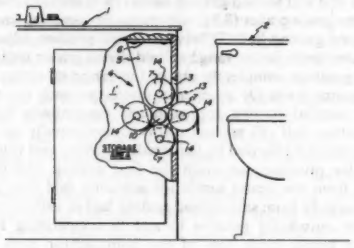
if said leader is detected within said predetermined period of time, extracting said film with film conveying means; and discarding the empty cartridge into an empty cartridge collection area when said film has been extracted.

4,557,426

DISPENSER FOR TOILET PAPER AND THE LIKE

Stephen J. Siciliano, 1701 NW. 2nd St., Deerfield Beach, Fla. 33441

Filed Jun. 28, 1984, Ser. No. 625,687
Int. Cl.[4] B65H *19/04*
U.S. Cl. 242—55.3 **3 Claims**



1. A system for dispensing rolled sheet material, said system comprising:

a rotary member disposed for rotation about a generally horizontal axis;

a plurality of generally elongate spool means for carrying said sheet material, each of said plurality of spool means being cantileveredly attached to said rotary member and fixed to said rotary member for rotation with said rotary member about said generally horizontal axis;

wherein said system comprises a generally vertically disposed partition means, said partition means comprising an opening means, said rotary member being located, and said opening means sized, shaped, and disposed, to enable each of said plurality of spool means to be manually accessible across said partition means by rotating said rotary member about said generally horizontal axis until a selected one of said plurality of spools is within said opening means, wherein said system further comprises a means for fixing said rolled sheet material against movement along the elongate length of said spool means, said means for fixing comprising a bracket and a key lock means for aligning said bracket and said spool.

4,557,427

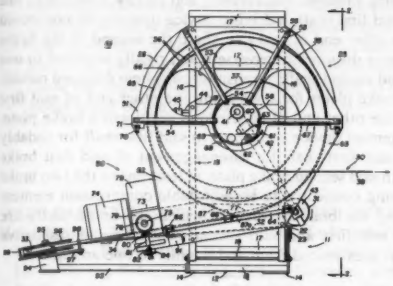
POWERED STRAP ACCUMULATOR

Robert A. Johnson, Flossmoor, Ill., assignor to Interlake, Inc., Oak Brook, Ill.

Filed Oct. 15, 1984, Ser. No. 660,696
Int. Cl.[4] B65H *16/00*
U.S. Cl. 242—55 **20 Claims**

7. A strap accumulator for use in accumulating strap dispensed from the outside of a supply reel so that the accumulated strap can be withdrawn to associated strapping equipment with minimal resistance, said accumulator comprising: a flexible expandable hoop having an inner surface on which a ribbon-wound coil of dispensed strap may be formed, bias means resiliently urging said hoop to a contracted condition, said ribbon-wound coil naturally tending to expand against said inner surface for moving said hoop to an expanded condition against the urging of said bias means, said hoop having an opening therein, feed means for receiving strap dispensed from the supply reel and feeding it through said opening to the outside of said coil along said inner surface of said hoop, retaining means cooperating with said hoop to retain said coil thereon and accommodating withdrawal of the accumulated strap from the center of said coil, withdrawal of strap from the center of said coil causing contraction thereof away from said

hoop and permitting movement of said hoop to its contracted condition by said bias means, and control means coupled to



said hoop and responsive to movement thereof between the expanded and contracted conditions thereof for controlling the operation of said feed means.

4,557,428

WIRE LAYING ARM

Bernhard Heimann, Essen, Fed. Rep. of Germany, assignor to Fried. Krupp Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany

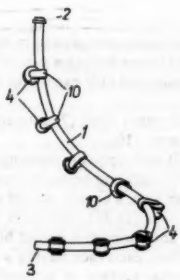
PCT No. PCT/EP83/00317, § 371 Date Jul. 26, 1984, § 102(e) Date Jul. 26, 1984, PCT Pub. No. WO84/02294, PCT Pub. Date Jun. 21, 1984

PCT Filed Nov. 26, 1983, Ser. No. 637,225

Claims priority, application Fed. Rep. of Germany, Dec. 15, 1982, 3246420

Int. Cl.⁴ B21C *47/00*

U.S. Cl. 242—82 **5 Claims**



1. Wire laying device comprising:

a laying arm composed of a tube having a tube wall and having an upstream end at which a wire is introduced into said tube and a downstream end at which the wire exits from said tube, said tube being formed to follow a curved path having the form of a three-dimensional spiral between said upstream and downstream ends, said curved path having, at each point therealong, a curvature lying in a given plane and having a given center of curvature, said tube having a plurality of recesses spaced apart along the curved path; and

a roller guide for guiding a wire which is being advanced through said tube, said guide comprising a plurality of profiled rollers supported by said tube and spaced apart along said curved path, each said roller having an axis of rotation and being mounted so that its profile extends into a respective recess to the extent that, at least in the region of each said respective recess, a wire located within said tube is spaced from said tube wall at locations spaced from the associated roller along said curved path toward both ends of said tube;

wherein each said roller is mounted individually so that only one said roller is disposed at a respective point along said curved path, each said roller is disposed at the side of said curved path which is directed away from the given center of curvature of the respective point along said curved path, and each said roller has its axis of rotation oriented perpendicular to the given plane of curvature at the respective point of curvature of said curved path.

4,557,429

LEVEL WINDER FOR DOUBLE-BEARING REEL OF FISHING ROD

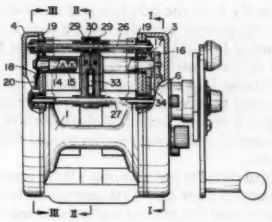
Takashi Atobe, Higashikurume, Japan, assignor to Daiwa Seiko, Inc., Higashikurume, Japan

Filed Jun. 6, 1984, Ser. No. 617,745

Claims priority, application Japan, Jul. 6, 1983, 58-122866; Jul. 12, 1983, 58-107894

Int. Cl.⁴ A01K *89/04, 89/015*

U.S. Cl. 242—84.42 **2 Claims**

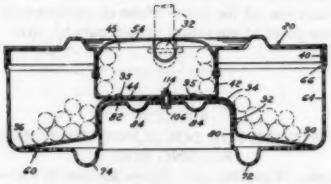


1. In a double-bearing reel for a fishing rod, said reel having side walls, frame bases on said side walls, a handle shaft and a spool shaft supported rotatably between side walls of said reel with a spool attached therearound; a driving gear on said handle shaft; a pinion, mounted on one end portion of said spool shaft, for meshing with said driving gear, said pinion engaging with, and disengaging from, said spool shaft; clutch means for causing said pinion to unitarily engage with, and disengage from, said spool shaft; and clutch-returning means for actuating said clutch means when said handle shaft is rotated in the direction in which a fishing line is wound in, whereby said pinion can be disengaged from, and unitarily engaged with, said spool shaft; a level winder comprising a traverse cam shaft held between portions of said frame bases on said side walls in front of said spool, said traverse cam shaft being rotated by said driving gear mounted on said handle shaft; a guide cylinder mounted around an outer portion of said traverse cam shaft and rotatably supported between said frame bases; a slidable member mounted around said guide cylinder for rotating unitarily with said guide cylinder and moving along said guide cylinder reciprocally in a lateral direction; a locking recess formed in said slidable member; smooth guide surfaces formed on portions of said slidable member on either side of said locking recess; notches formed in portions of said guide surfaces on the side thereof toward said spool; a pair of guide rods supported between said side walls; right and left line guide arms mounted slidably on said guide rods and urged resiliently in opposite directions by a spring; and locking pins projecting from said guide arms, said locking pins being retractable into said guide arms, and defining means for engaging said locking recess so that a fishing line guide portion is formed between said two guide arms; said locking pins being disengaged from said locking recess through said notches when said slidable member is rotated.

4,557,430
POWER CORD STORAGE AND DISPENSER

Robert B. Bonhard, 23230 Tireman Ave., Dearborn Heights, Mich. 48127

Filed Jul. 19, 1984, Ser. No. 632,226
Int. Cl.[4] B65H *75/40*
U.S. Cl. 242—96 3 Claims



1. A portable storage case for an electrical power cord having male and female connectors at each end which comprises:

(a) a generally dish-shaped circular molded plastic case having a radially extending side face having a first dished portion to form a first flat central wall portion spaced inwardly from the side face and an axially extending outer wall to overlie said dished portion and form a storage chamber for said power cord, the case being open at the side opposite said side face,

(b) a circular face plate disposed at said opening to close said case and relatively rotatable to said case, said face plate having a second central dished portion having a second flat central wall lying parallel to said first flat central wall portion,

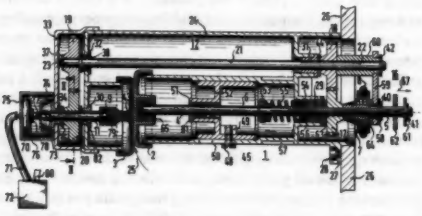
(c) a third circular plate having a third central dished portion telescoped over said first central dished portion and affixed to said flat central wall of said second central dished portion, said third plate having a brim in the form of a cone extending from said third dished portion toward said side face of said case, the edge of said brim at the base of said cone lying in contact with said face to stabilize said circular face plate and said third circular plate, said face plate and said third circular plate forming a spool for receiving a power cord wound around the axis of said plates, and

(d) axle means mounting said flat central walls of said spool on said first flat central wall of said first dished portion.

4,557,431
CONTROLLABLE AND ADJUSTABLE YARN TENSIONING DEVICE

Wilhelm Zitzen, Monchen-Gladbach, Fed. Rep. of Germany, assignor to W. Schlafhorst & Co., Monchen-Gladbach, Fed. Rep. of Germany

Filed Mar. 5, 1984, Ser. No. 585,980
Claims priority, application Fed. Rep. of Germany, Aug. 17, 1983, 3329644; Aug. 17, 1983, 3329645
Int. Cl.[4] B65H *59/24*
U.S. Cl. 242—150 R 8 Claims

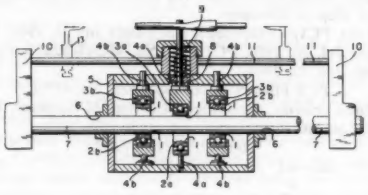


1. Controllable and adjustable yarn tensioner having first and second rotationally driven brake plates, between which yarn to be placed in tension is guided, comprising first and second rotationally supported shafts, the first of the brake plates being disposed transversely and rigidly attached to one end of said first shaft, a driving device operatively connected with the other end of said first shaft; the second of the brake plates being disposed transversely and rigidly attached to one end of said second shaft; a transmission system disposed outside of said brake plates for connecting the other end of said first shaft to the other end of said second shaft; and a brake plate-disengagement device connected to said first shaft for slidably moving said first shaft for disengagement of said first brake plate with said second brake plate; at least one of the two brake plates being connected to an adjustable compression element for setting the braking force at which the brake plates are applied; said first and said second shafts having respective rotational axes spaced from and parallel to one another.

4,557,432
STROKE APPARATUS

Ryoichi Ito, 12-2 Uguisudani-cho, Shibuya-ku, Tokyo, Japan

Continuation-in-part of Ser. No. 520,860, Aug. 8, 1983, abandoned. This application Apr. 29, 1985, Ser. No. 728,089
Claims priority, application Japan, Aug. 10, 1982, 57-137995
Int. Cl.[4] B65H *54/28*
U.S. Cl. 242—158 R 1 Claim



1. A stroke apparatus, comprising in combination:

(a) an elongated frame having a pair of spaced support arms (**10**) and a guide rail (**11**) extending between said support arms;

(b) a horizontal rotary shaft (**7**) rotatably mounted between the support arms (**10**);

(c) a housing (**5**) with opposite openings (**6**) said rotary shaft (**7**) passing through and being journaled in said openings;

(d) at least outer first, a center second and outer third annular vertical races (**2***b*,**2***a*), said races having a defined top and bottom, and supported in said housing (**5**) equidistant from each other, each race having a central opening with an inner annular surface of arcuately bulging cross-section, the shaft (**7**) passing through said races, the central opening of said races being substantially larger than the diameter of said shaft;

(e) pivotal shaft supports (**3***b*,**3***a*), supporting each race, and also respectively supporting an outer first, a center second and an outer third shaft (**4***b*,**4***a*), the axis of the center shaft (**4***a*) being perpendicular to and intersecting the rotary shaft (**7**), the axes of the outer first and third shafts being both equidistantly offset from said rotary shaft (**7**), all three shafts being parallel;

(f) spring means (**9**) affixed to said center second race (**2***a*), biasing the bulging section of said center second race against said rotary shaft (**7**) so that the top of said race bulging section is in contact with said shaft, and said outer first and outer third races being so disposed that said shaft is in contact with the bottom of the outer first and outer third races so that said outer first and outer third races are vertically aligned, whereas the center second race is vertically offset from the outer first and outer third races, the bottom of said center second race being below the bottom

of said outer first and outer third races; where-by, when said rotary shaft (7) turns, because of the bulging center section, and the outer first and third shafts (4*b*) having their axes offset from the center shaft (4*a*), the center race tends to incline at an angle from the vertical in one direction while the outer first and outer third races tend to incline in the opposite direction, the torque tending to cause the angle of incline being proportional to the rotational speed of the rotary shaft (7).

4,557,433

TAPE CASSETTE AND SPRING MEMBER THEREFOR

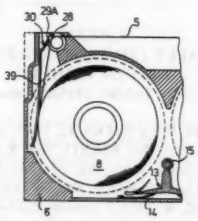
Horst Fitterer, Mannheim; Roland Roos, Ludwigshafen; Wulf Muenzner, Frankenthal; Werner Balz, Limburgerhof, and Heinz Berger, Kehl, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jun. 23, 1983, Ser. No. 507,110

Claims priority, application Fed. Rep. of Germany, Jun. 25, 1982, 8218184[U]

Int. Cl.[4] B65H *59/38;* G03B *1/04;* G11B *15/32*

U.S. Cl. 242—187 **16 Claims**



1. A tape cassette comprising two flanged reels on which a magnetic tape having a coated and an uncoated side is wound into rolls and, between the flanges of each reel, at least one spring member which constantly bears against the periphery of the tape roll, and at least one tape guide means having a conductive surface, wherein the spring member is a strip of thin flexible and electrically conductive material which makes contact with the periphery of the roll in the vicinity of the point where the tape joins or leaves the roll, and which has a slit free end which constitutes a conductive connector, one end portion being in contact with the coated side of the tape and the other end portion with said conductive surface of the tape guide means.

4,557,434

TAPE REMAINING CIRCUIT

Marshall Williams, Fremont, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Sep. 16, 1982, Ser. No. 418,907

Int. Cl.[4] G01B *1/04;* G11B *15/32*

U.S. Cl. 242—189 **15 Claims**

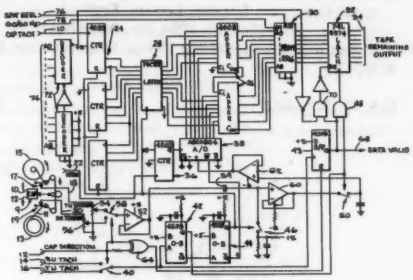
10. A circuit for determining the tape remaining on a reel wherein the tape movement is responsive to a tension arm, comprising:

means for supplying a first count value indicative of the extent of tape movement relative to a selected reel rotation;

means for generating a second count value indicative of a change in the tension arm position;

means for clamping said means for generating the second count value, prior to initiating the first count value;

wherein the second count value is generated at the end of the first count value; and



means for adding the second count value to the first count value to provide a corrected tape remaining output signal.

4,557,435

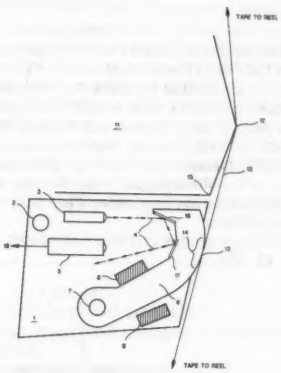
MAGNETIC TAPE TENSION SENSOR

Terry Reishus, Broomfield, Colo., assignor to Storage Technology Corporation, Louisville, Colo.

Filed Nov. 29, 1982, Ser. No. 445,139

Int. Cl.[4] G03B *1/04;* G11B *15/32;* B65H *59/38*

U.S. Cl. 242—190 **5 Claims**



1. A tape tension sensor unit for a magnetic tape drive of the type in which the magnetic tape is driven from reel to reel past a magnetic recording head, comprising:

means for emitting a narrow beam of light;

means for reflecting the incident light onto a light detecting means when the tape is in a non-tensioned condition comprising:

a rotatably mounted arm, said arm having a generally reflective inner surface from which the light beam is reflected, and mounted such that when the tape is in a non-tensioned condition, gravity rotates the arm to a downward position wherein the light beam from the means for emitting a narrow beam of light is reflected into the light detector, but such that when the tape is tensioned, the tape rotates the arm upwardly causing the reflected light to be misaligned and not be incident upon the light detector, and;

a light detector, for detecting light properly reflected onto said light detector.

4,557,436

APPARATUS FOR STORING A CABLE

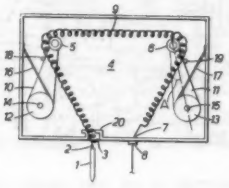
John A. Drake, Biggleswade, England, assignor to International Computers Limited, London, England

Filed Nov. 23, 1984, Ser. No. 674,512

Claims priority, application United Kingdom, Dec. 14, 1983, 8333363

Int. Cl.⁴ B65H *75/34*

U.S. Cl. 242—47.5 **3 Claims**



1. Apparatus for storing a cable including; a container having an aperture therein through which the cable passes, the cable having at least a part formed into a coiled configuration to render the part resiliently extensible and having an operative end remaining outside the container and a portion remote from said operative end secured inside the container; and a loop-forming arrangement within the container comprising a pair of arms pivotted at one end for independent rotation and each carrying a freely rotatable pulley at an end opposite said one end around which pulleys a loop of the cable is formed, and tensioning means for applying tension to the arms to cause them to rotate and thereby expand said loop.

4,557,437

PROCESS FOR FLIGHT-ATTITUDE-ADJUSTMENT OF A FLYING BODY AND/OR ACTIVATION OF LIVE LOAD CARRIED BY THE FLYING BODY AND ARRANGEMENT FOR CARRYING OUT THE PROCESS

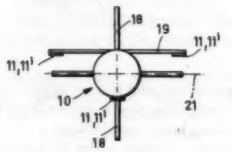
Jens Seidensticker, Kaarst, and Werner Grosswendt, Ratingen, both of Fed. Rep. of Germany, assignors to Rheinmetall GmbH, Duesseldorf, Fed. Rep. of Germany

Filed Aug. 5, 1982, Ser. No. 405,417

Claims priority, application Fed. Rep. of Germany, Aug. 5, 1981, 3130930

Int. Cl.⁴ F41G *7/00*; **F42C** *13/06*

U.S. Cl. 244—3.21 **3 Claims**



1. In an improved arrangement for controlling the flight attitude of a winged flying body or the activation of a useful live load being transported by a flying body, or both, the improvement comprising:

three combined emitter-receiver units for radiating ultrasound energy in pulsed modulated form and spatially selectively receiving the energy which, after being radiated is then reflected by objects in the vicinity of said flying body;

one emitter-receiver unit is located at the outer most region of each wing of said winged flying body and one emitter-receiver unit is mounted on the underside of the flying body in a different vertical plane than the wing mounted emitter-receiver units;

means for actuating one of the functions selected from the group of functions which consists of flight attitude control or activation of a useful live load of a flying body in response to the received energy;

a central control unit connected to a pulse generator for controlling time lapses within each emitter-receiver unit;

a modulator connected to each emitter-receiver unit such that the pulse generator controls the emission of ultrasound via the modulator;

a pulse time measuring unit connected to said central control unit for measuring the emitted and reflected ultrasound signals;

first and second counters, said first counter being adjustable to a predetermined value and said second counter connected to said pulse time measuring unit to indicate the value which has been determined by said pulse time measuring unit;

a comparator stage connected to both counters to receive the counted pulse signals therefrom and to emit control signals in dependence on the comparison values processed in said comparator stage;

an output stage connected to said comparator stage and a second control unit to adjust and control the flight attitude of the flying body or the activation of a useful load of the flying body, or both in accordance with the control signals received from the output stage.

4,557,438

HYDRAULICALLY CONTROLLED, FLUID-STREAM DRIVEN VEHICLE

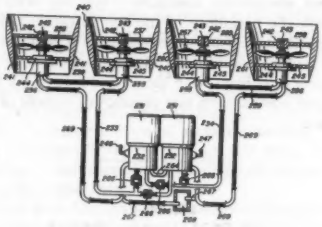
Karl Eickmann, 2420, Isshiki, Hayama-machi Kanagawa-ken, Japan

Division of Ser. No. 841,979, Oct. 13, 1977, abandoned, which is a continuation of Ser. No. 610,871, Sep. 8, 1975, abandoned, which is a division of Ser. No. 416,237, Nov. 15, 1973, abandoned, which is a division of Ser. No. 131,782, Apr. 6, 1971, Pat. No. 3,790,105, which is a continuation-in-part of Ser. No. 782,349, Dec. 9, 1968, abandoned, which is a continuation-in-part of Ser. No. 551,023, May 18, 1966, abandoned, and Ser. No. 328,395, Dec. 5, 1963, Pat. No. 3,320,898. This application Nov. 5, 1979, Ser. No. 91,651

The portion of the term of this patent subsequent to Feb. 5, 1991, has been disclaimed.

Int. Cl.⁴ B64D *35/02*

U.S. Cl. 244—60 **1 Claim**



1. A fluid stream driven vehicle comprising, in combination, a body having a longitudinal plane of substantial symmetry; at least one pair of hydraulic fluid operated motors on said body, with the motors of each pair being arranged symmetrically on opposite sides of said plane; respective fluid stream creating driving means driven by each motor; a fluid tank; at least one hydraulic fluid flow producing means communicated to said fluid tank; said fluid flow producing means including a plurality of separated working chamber groups of a plurality of commonly acting chambers and displacement means in each of said groups and said fluid flow producing means producing at least one pair of separated and independent output flows of hydraulic fluid under pressure, with the rates of flow of the at least two output flows being constantly equal to each other;

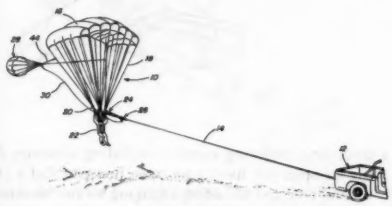
separate and independent supply lines delivering one flow directly to at least one motor on one side of the vehicle's body and the other flow directly to at least one motor on the opposite side of the vehicle's body; the number of motors supplied by each flow being equal to that supplied by the other flow; and respective return lines connecting each motor to said fluid tank; whereby the fluid stream creating means on opposite sides of said plane are driven at equal velocities to produce equal thrusts on both sides of said axis for stabilizing the direction of movement and the attitude of said vehicle.

4,557,439

INFLATABLE AIRFOIL CANOPY LAUNCHING METHOD AND APPARATUS

Elek Puskas, Mt. Holly, N.J., assignor to Para-Flite, Inc., N.J.

Filed Oct. 27, 1981, Ser. No. 315,475
Int. Cl.⁴ B64F *1/10*
U.S. Cl. 244—63 **6 Claims**



1. In combination with a wheeled, ground towing vehicle, an aerial device having a launch assisting drogue chute connected thereto and apparatus for launching the aerial device, including a towline connecting the vehicle to the aerial device, the improvement comprising means for selectively disconnecting the towline from the vehicle and the drogue chute from the aerial device after launching thereof, and means for suspending the disconnected towline from the disconnected drogue chute acting as a payload parachute, including means coupling the drogue to the aerial device for correction of flight path disturbances caused by lateral forces acting thereon in directions transverse to the towline during launching of the aerial device.

4,557,440

MOVABLE PANEL WITH COMPOUND CURVATURE AND METHOD OF MAKING SAME

Ronald Adams, Edmonds, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Aug. 18, 1983, Ser. No. 524,335
Int. Cl.⁴ B64C *1/14*
U.S. Cl. 244—129.4 **31 Claims**

1. For use in a wall of an aircraft, said wall having an outer surface with a compound curvature, a movable panel comprising:

right edge member means having a longitudinal axis that conforms to said curvature along the right edge of the panel and including right mating surface means with an essentially constant cross-sectional shape;

left edge member means having a longitudinal axis that conforms to said curvature along the left edge of the panel and including left mating surface means with an essentially constant cross-sectional shape;

a plurality of spaced-apart lateral beams, each of which has a right end portion, a left end portion, and a center portion; and

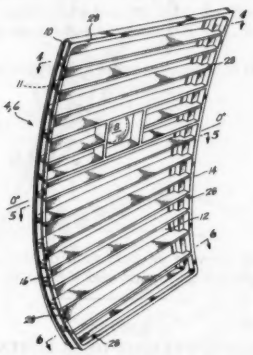
means for securing each right end portion to the right edge member means and each left end portion to the left edge member means;

wherein each of said right end portions is essentially identical, each of said left end portions is essentially identical, and each of said center portions is oriented at a substantially constant predetermined angle with respect to a center line located substantially midway between said right and left edge member means; and

wherein each of said right and left edge member means has a configuration that is twisted about its respective longitudinal axis, to position said right and left mating surface means so that they will be in mating engagement with each of said right and left end portions, respectively, in the assembled panel.

27. A method of making a movable panel to be installed in an opening in a wall of an aircraft, said wall having a compound curvature, comprising:

selecting a center reference line;



positioning a plurality of beams with substantially identical end portions in a spaced-apart relation along said reference line and orienting the longitudinal axes of said beams to form a substantially constant angle with said line;

forming edge members to have mating surfaces with substantially constant cross-sectional shapes, to have longitudinal axes that conform to said compound curvature along the lateral edges of said opening, and to have configurations that are twisted about their respective longitudinal axes to cause the mating surfaces to be positioned to matingly engage opposite end portions of each of the beams; and

securing said opposite end portions to said edge members.

4,557,441

BAND TENSIONING DEVICE

Eric L. Aspinall, Federal Way, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Dec. 27, 1983, Ser. No. 566,028
Int. Cl.⁴ B64D *29/06*; F16L *33/00*
U.S. Cl. 244—129.4 **15 Claims**

1. In an aircraft having at least one jet engine, said engine being surrounded by a cowl, said cowl being divided into a first portion and a second portion movable between open and closed positions to expose or conceal the engine components, said engine having a first portion and a second portion axially adjacent said first portion, said first and second portions being held together by a V-band circumscribing the area of the joint between said first and second portions, a tensioning assembly for applying tension to said V-band, said tensioning assembly comprising:

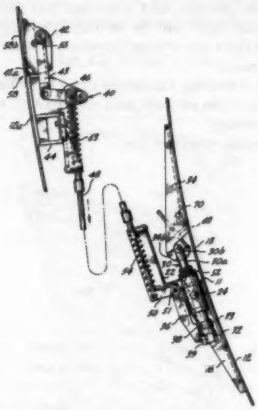
a T-bolt having a shank portion and a T-head portion affixed to a first end of said shank portion;

means for mounting said T-bolt to a first end of said V-band;

keeper means affixed to a second end of said V-band and constructed and arranged to cooperably receive said T-head portion of said T-bolt;

a nut threadably engaged with said shank portion of said T-bolt and operable to draw said T-head portion of said T-bolt toward said first end of said band; and,

indicator means mounted on said engine remotely from said T-bolt mounting means, operably associated with said



T-bolt to provide an indication of the attainment of a predetermined tension on said V-band.

4,557,442

EMERGENCY FLIGHT DECK EGRESS LINES

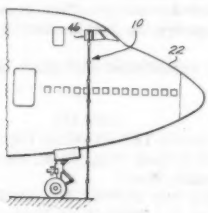
John E. Krezak, Bellevue, and Michael F. Lamb, Mukilteo, both of Wash., assignors to The Boeing Company, Seattle, Wash.

PCT No. PCT/US83/01403, § 371 Date Sep. 14, 1983, § 102(e) Date Sep. 14, 1983, PCT Pub. No. WO85/01264, PCT Pub. Date Mar. 28, 1985

PCT Filed Sep. 14, 1983, Ser. No. 547,214

Int. Cl.⁴ B64D *25/08*

U.S. Cl. 244—137 P **10 Claims**



1. A lightweight escape line for an airplane comprising: a high strength polymeric braided cord forming a core, means for securing one end of the cord to a support structure in an airplane, a series of spaced apart foamed resin knobs each having an axial opening for closely fitting over the braided core and each knob bonded with a thermosetting resin to the cord, and a high strength polymeric woven jacket closely covering the cord with bonded knobs to form a lightweight escape line from the airplane to the ground.

4,557,443

POSITIONALLY ADJUSTABLE KITE STRUT CONNECTOR

Julius M. Christoffel, Jr., Houston, Tex., assignor to Gayla Industries, Inc., Houston, Tex.

Filed Aug. 29, 1983, Ser. No. 527,420

Int. Cl.⁴ B64C *31/06*

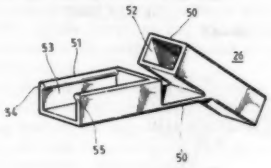
U.S. Cl. 244—153 R **6 Claims**

1. A positionally adjustable strut connector for a kite having a body of flat material symmetrically disposed about a centerline, a pair of diverging wing-struts having first and second ends and being secured to the body on opposite sides of said centerline, and a cross-strut, said positionally adjustable strut connector comprising:

a first body member disposed about a first longitudinal axis, and adapted to receive one of said wing-struts and to be located intermediate said first and second ends of said one wing-strut, said first body member including:

a hollow wing-strut receiving member having a top end and a bottom end; and

a second body member disposed about a second longitudinal axis, and adapted to receive one end of said cross-strut, said second body member including:



a cross-strut receiving member including structure defining an open slot having an open first end and a closed second end, and including engaging means for retaining said cross-strut in place, said first end being adapted to receive said one end of said cross-strut, and said second end being disposed proximate said top end of said wing-strut receiving member such that said first and second longitudinal axes are separated by an acute angle; and

a hinge member depending from said cross-strut receiving member and extending beyond said second end of said cross-strut receiving member;

wherein said hinge member of said second body member is connected to said wing-strut receiving member of said first body member; and

further wherein the angular separation between said first and second longitudinal axes is selectively adjustable.

4,557,444

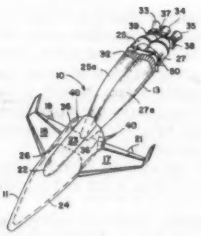
AEROSPACE VEHICLE

L. Robert Jackson, and Allan H. Taylor, both of Newport News, Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jan. 9, 1984, Ser. No. 569,371

Int. Cl.⁴ B64G *1/40, 1/58*

U.S. Cl. 244—172 **8 Claims**



1. An aerospace vehicle comprising a reusable aeroshell structure and a releasably contained reusable separate integral fuel tank/thrust structure disposed within said aeroshell vehicle structure,

connection means releasably attaching said aeroshell structure and said fuel tank/thrust structure,

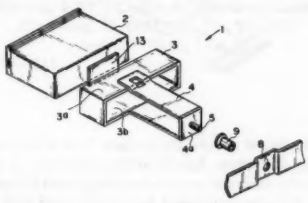
said connection means providing unrestrained thermal growth between said aeroshell structure and said integral tank/thrust structure while concurrently transmitting aero-inertial loads without relative motion between said structures.

4,557,445

AUTO DEVICE MOUNTING STRUCTURE

Seishichi Ohara, Tokyo, Japan, assignor to Clarion Co., Ltd., Tokyo, Japan

Filed Apr. 20, 1984, Ser. No. 602,588
Claims priority, application Japan, Sep. 14, 1983, 58-141419
Int. Cl.⁴ G12B *9/00*
U.S. Cl. 248—27.1 **4 Claims**



1. An auto device mounting structure for mounting an auto device in an aperture in a panel of a car, which structure comprises:

a sleeve-shaped bracket member receiving therein the auto device inserted from the front end thereof;

a rear frame consisting of two parallel plates coplanarly, rearwardly extending from opposed plates of said bracket member, and a rear end plate uniting said parallel plates together;

a projection rearwardly projecting from said rear end plate; and

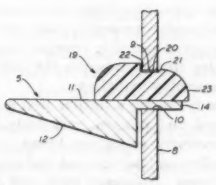
a separate part secured to a fixed position of the car spaced behind said panel and having at least one hole receiving said projection therethrough, said projection being threaded along the outer circumference thereof and fixed to said separate part by a nut applied thereto behind said hole.

4,557,446

CABLE RETENTION CLIP

Earl L. Barron, P.O. Box 10356, Houston, Tex. 77206

Filed Dec. 2, 1982, Ser. No. 433,156
Int. Cl.⁴ F16L *3/00*
U.S. Cl. 248—65 **4 Claims**



1. The combination with a cable retention system having a vertically-extending, channel-shaped wall rack member with a plurality of vertically spaced retaining T-slots therein, a cable hanger having a T-shaped end portion with a neck portion fitting the base portion of one of said T-slots to retain the same in place, of

a resilient, flexible plastic retaining clip wedged between said T-shaped end portion of said cable hanger and the upper edge of the T-slot in which it is positioned to secure said cable hanger against accidental dislodgment,

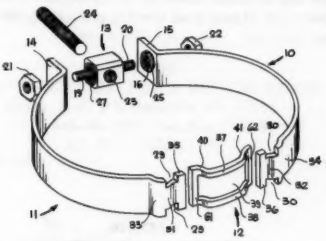
said clip comprising a formed resilient flexible piece of plastic having an indentation along its top surface with a low ridge along one edge thereof and a higher wall along the other edge fitting on opposite sides of the upper edge of the T-slot in which it is positioned.

4,557,447

PIPE CLAMP

Hubert Combe, Lankwitzer Str. 39, 1000 Berlin 42, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 319,544, Nov. 9, 1981, Pat. No. 4,407,479. This application Jun. 24, 1983, Ser. No. 508,071
Claims priority, application European Pat. Off., Feb. 1, 1983, 83730009.4
The portion of the term of this patent subsequent to Oct. 4, 2000, has been disclaimed.
Int. Cl.⁴ F16L *3/08*
U.S. Cl. 248—74.1 **8 Claims**



1. A pipe clamp comprising,

two facing oppositely curved clamp segments having adjacent, circumferentially spaced pairs of ends, a first end pair connected by a bridge piece forming an interlocking relation with each member of the end pair the interlocking first pair of ends and the bridge piece following the curvature of the curved clamp segments, the clamp segments having flat contact areas facing each other at the second end pair, the contact areas having inwardly facing, annular, first serrated surfaces defining holes within each annular surface,

a joint member joining the second end pair having a central region of larger diameter and at least one end region of narrower diameter, the central region terminating on opposite sides in annular second serrated surfaces for engaging the first serrated surfaces of the contact areas, the end region of narrower diameter passing through a hole in an annular surface and having means for clamping the joint member relative to the contact areas.

4,557,448

CLAMPING ASSEMBLY

Marvin L. Brown, and Ronald T. Jarrett, both of West Burlington, Iowa, assignors to J. I. Case Company, Racine, Wis.

Filed Apr. 1, 1985, Ser. No. 718,579
Int. Cl.⁴ A62C *23/04*
U.S. Cl. 248—75 **5 Claims**

1. A clamping assembly for hoses which are connected between a tractor and piston-cylinders on an attached implement, said clamping assembly comprising:

a base and at least one clamping element, said base including a bearing surface, an arcuate bearing wall, an opening for said hoses, and an angled bearing surface;

each hose extending through said base opening and abutting against said arcuate base bearing wall;

said clamping element including a base portion, an arcuate end wall, and an angled bearing wall, said clamping ele-

ment further including opposed spaced apart legs extending from said base portion;

a bolt fastener extending between the spaced apart legs on said clamping element through an opening in said clamp-

ing element and through an opening in said base bearing surface, and said bolt fastener having a head with the spacing between said legs being slightly more than the dimension of said head thereby preventing turning of said bolt fastener.

4,557,449

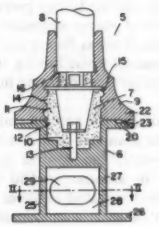
POST MOUNTING ASSEMBLY

Murray J. Davidson, and John E. Chetland, both of Auckland, New Zealand, assignors to Repco Engineering (NZ) Limited, Auckland, New Zealand

Filed Dec. 22, 1983, Ser. No. 564,378

Int. Cl.⁴ F16M *13/00*

U.S. Cl. 248—160 **9 Claims**



1. A post mounting assembly comprising:

a post mounting base;

a post end fitting;

means to attach said post end fitting to one end of a post;

a socket in said post end fitting;

an elastically deformable post mount connecting means for releasably attaching said post end fitting in substantially fixed position with said base having a base section and an annular engagement section;

said annular engagement section being receivable within said socket;

means for attaching said base section to said base; and

complementary male and female screw-thread sections on said annular engagement section and interior surface of said socket, so that said post is disengageable from said base by elastic deformation of said post mount connecting means and reattachable to said base upon elastic recovery of said connecting means.

4,557,450

DRAWING BOARD LOCKING DEVICE

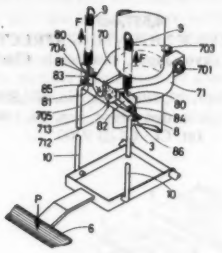
Alain Bruneau, Montferrand le Chateau, France, assignor to Alpia S.A., Besancon, France

Filed Sep. 19, 1983, Ser. No. 533,546

Claims priority, application France, Sep. 22, 1982, 82 16328

Int. Cl.⁴ F16M *11/00*

U.S. Cl. 248—162.1 **8 Claims**



4. The invention according to claim 2, in which said means for moving said plate downwardly comprises a foot pedal lever pivotally mounted on a lower part of said frame structure and means for connecting said foot pedal lever with said plate for movement of said plate downwardly upon downward pressure being applied to said foot pedal lever.

4,557,451

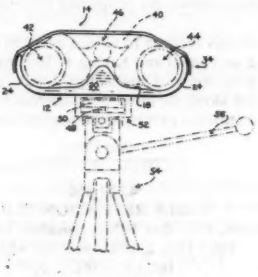
BINOCULAR RESTS

Joseph Conway, 50 Tower Rd., Newton, Mass. 02164

Filed Sep. 10, 1984, Ser. No. 648,488

Int. Cl.⁴ F16M *11/04*

U.S. Cl. 248—187 **6 Claims**



1. In a binocular apparatus of the type including a binocular having a first monocular assembly and a second monocular assembly, and a support assembly coupled to said binocular to hold said binocular steady; wherein the improvement comprises a support assembly including:

an elongated body having a flexible first end portion and a flexible second end portion, said body being provided with a transversely extending hump centrally located between said first end portion and said second end portion which is adapted to engage both said first monocular assembly and said second monocular assembly along a substantial portion of their length, wherein said flexible first end portion is adapted to engage at least partially around and conform to the shape of said first monocular assembly and wherein said flexible second end portion is adapted to wrap at least partially around and conform to the shape of said second monocular assembly, said second flexible end portion being provided with a first cooperating fastener;

mounting means attached to a surface of said elongated body opposite said hump, said mounting means including a nut provided with a threaded bore; and

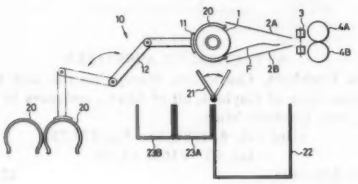
an elongated, flexible strap having a first end attached to said first end portion of said elongated body, a second end, and a second cooperating fastener attached to said second end, said second cooperating fastener being removably engaged with said first cooperating fastener, said strap adapted to wrap said first flexible end portion against said first monocular assembly, said second flexible end portion against said second monocular assembly, said strap adapted to urge both said first monocular assembly and said second monocular assembly against opposing sides of said hump.

4,557,452

SPACE-SAVING HANGING DEVICE

Nhon H. Khuong, 1707 W. 149th St., Gardena, Calif. 90247

Filed Aug. 12, 1983, Ser. No. 522,788
Int. Cl.⁴ E04G *5/06*
U.S. Cl. 248—214 **3 Claims**



1. A foldable beverage holder device comprising a mounting plate element, a hollow ring top element pivotably secured to said mounting plate for retaining an article such as a cup of beverage or the like, a cup like bottom element pivotably secured to the bottom end of the mounting plate for supporting said article; said ring top element including two slots at one side disposed at a 90° angle relative to one another, one of said slots for engaging an upper lip located on the mounting plate when desired to secure the ring top element in a downward folded vertical position, and the other of said slots for engaging said upper lip when desired to secure the ring top element in a horizontal supporting position; said cup like bottom element including an extended arm which is inserted through an opening in the bottom end of the mounting plate, said extended arm comprising two pins extended outwardly from said extended arm at its end opposite from the cup like member to secure the cup like bottom member in a horizontal supporting position.

4,557,453

GURNEY ATTACHMENT

Glean A. McCloskey, 4022 Lonnie St., Oceanside, Calif. 92056

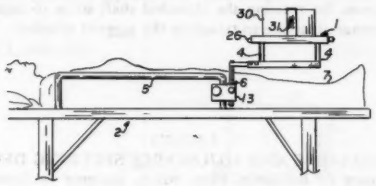
Filed May 25, 1984, Ser. No. 614,125
Int. Cl.⁴ E04G *3/00*
U.S. Cl. 248—287 **4 Claims**

1. An attachment for a gurney having side handrails for transporting a patient, comprising:

a tray for supporting medical equipment, said tray having a cradle for supporting a gas bottle, a resilient bumper along an edge facing the patient on said gurney and an IV pole pivotally attached to one edge of the tray so as to pivot between a rest position aligned with the tray edge and a raised vertical position;

securing means for adjustably securing the tray to the side handrails;

said securing means comprising a pair of downwardly depending legs at each side of the tray, a horizontal cross-bar jointing the base of each pair of legs, a pair of releasable clamp members for clamping to the opposite side handrail, and a pair of leg members each having a first portion for adjustable horizontal attachment to a respective one of said cross-bars and a second portion for adjustable vertical



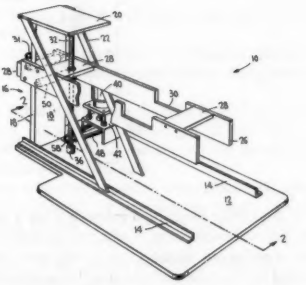
attachment to a respective one of said clamps, and a swivelling support for a heart monitor device, said swivelling support being pivotally mounted on said tray so as to be movable from a position over the tray to a position to one side of the tray.

4,557,454

LIFT MECHANISM FOR A DENTAL CHAIR

Anthony R. Urella, R.D. #2, Bernville, Pa. 19506

Filed Jul. 20, 1983, Ser. No. 515,486
Int. Cl.⁴ F16M *13/00*
U.S. Cl. 248—422 **20 Claims**



1. A lift mechanism comprising

(a) a base plate of sufficient dimensions to provide stability for the mechanism,

(b) a support member attached to the base plate and extending generally vertically from the base plate, said support member having a width relative to its height of about 1 to about 5 or less and having four generally continuous planar side surfaces, the two continuous side surfaces forming the width of the support member being parallel to each other,

(c) at least one diagonal strut attached at one end near the upper portion of the support member and at the other end to the base plate,

(d) a carriage structure extending generally horizontally from and traveling on said support member, said carriage structure comprising two parallel horizontal arms extending primarily in one direction from the support member and two horizontal rollers between said arms, one of said rollers contacting one of the parallel side surfaces of said support member and the other of said rollers contacting the other parallel side surface of the support member and the roller nearest to the portion of the arms extending from the support member being located lower in the carriage structure than the other roller, the width of the support member being approximately equal to the distance between the parallel horizontal arms of the carriage structure and said rollers

contacting essentially the entire width of the support member,

(e) a threaded shaft extending from the base plate and passing through an internally threaded nut attached to the carriage structure, and

(f) means for rotating the threaded shaft so as to cause the carriage structure to travel on the support member.

4,557,455

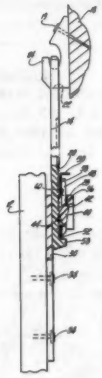
RELEASABLE AND ADJUSTABLE SECURING DEVICE

Benjamin C. Benjamin, Flint, Mich., assignor to Schmelzer Corporation, Flint, Mich.

Continuation of Ser. No. 290,070, Aug. 4, 1981, abandoned. This application Mar. 1, 1982, Ser. No. 353,053

Int. Cl.[4] A47G *1/24*

U.S. Cl. 248—496 **39 Claims**



35. A device for securing a member from a support member comprising: a flexible strap connected to one of said members, a latch mechanism slidably receiving said strap and being connected to the other of said members, complementary lock elements on said strap and on said latch mechanism permitting movement of said latch mechanism in one direction on said strap and preventing movement in the opposite direction relative to said strap, and slide means movable longitudinally of said strap relative to said latch mechanism being selectively operable to disengage said complementary lock elements and permit free movement of said members in opposite directions relative to each other.

4,557,456

DEVICE FOR DETACHABLY FIXING OBJECTS

Christoph Mueller, Kleiner Muristalden 28, CH-3006 Bern, Switzerland

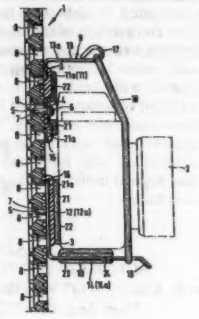
Filed Dec. 29, 1982, Ser. No. 454,510

Claims priority, application Fed. Rep. of Germany, Dec. 30, 1981, 3151964

Int. Cl.[4] A47B *96/06*

U.S. Cl. 248—499 **17 Claims**

7. Apparatus for detachably securing an object to a perforated plate, comprising: elastic means for securing an object; bracket means for attaching the elastic means to a perforated plate; retaining means, adapted to be attached to said perforated plate through an aperture of said perforated plate, for securing said bracket means to said perforated plate, said retaining means having a surface which engages said bracket



means; and means on said retaining means for laterally adjusting said bracket means relative to said retaining means.

4,557,457

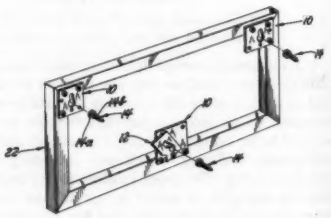
ATTACHMENT ASSEMBLY

William Cockfield, Charlevoix; Nancy Martin, and Barbara Murray, both of Gaylord, all of Mich., assignors to Frame-Lok, Inc., Gaylord, Mich.

Filed Feb. 6, 1984, Ser. No. 577,224

Int. Cl.[4] F16M *13/00*

U.S. Cl. 248—544 **23 Claims**



1. An attachment assembly for lockably but releasably securing a first object to a second object in cooperation with a fastener member of the type having a shank portion adapted to securingly engage a surface of the first object and a head portion spaced from the surface thus engaged, said attachment assembly comprising:

(A) a bracket plate adapted to be secured to a surface of the second object and having a keyhole opening therein including a head portion sized to pass the fastener member head portion and a slot portion sized to pass the fastener member shank portion but not the fastener member head portion;

(B) a locking plate, in assembly, maskingly overlying said bracket plate and mounted for movement on said bracket plate between

(1) an unlocked position in which said head portion of said keyhole opening is unmasked to allow passage of the fastener member head portion and

(2) a locked position in which said slot portion of said keyhole opening is unmasked and said locking plate blocks communication between the slot and head portions of said keyhole opening; and

(C) means operative, following passage of the fastener member head portion through said keyhole opening head portion with said locking plate in its unlocked position, to move said locking plate to its locked position in response to movement of the fastener member shank portion into

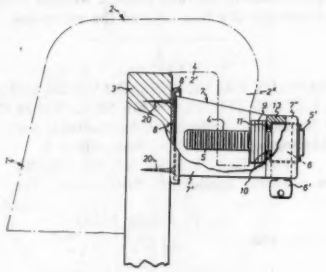
said slot portion, whereby to trap the fastener member shank portion in said slot portion and attach the first object to the second object.

4,557,458

ANTI-THEFT DEVICE FOR OUTBOARD MOTORS

Christer Vahlberg, Plöjargränd 57, S-263 00 Höganäs, and Odd Hielm, Backgatan 16, S-310 31 Eldsberga, both of Sweden

Filed Feb. 21, 1984, Ser. No. 582,214
Claims priority, application Sweden, Feb. 24, 1983, 8301016
Int. Cl.[4] A01K *97/10*
U.S. Cl. 248—553 **6 Claims**



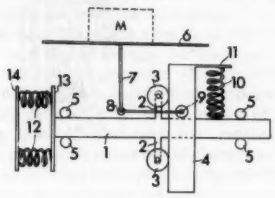
1. An anti-theft device for clamping and locking an outboard motor to a transom board and comprising a bracket, means connecting said bracket with an upper part of the outboard motor, said bracket forming with said part a substantially U-shaped suspension rack for mounting the outboard motor on the transom in a depending position adjacent the outboard side thereof and with one leg of the bracket extending down on the inboard side of the transom, and a clamping fixture including a clamping screw for urging said leg of the bracket away from the inboard side of the transom while clamping the motor to the outboard side thereof; wherein the clamping fixture is in the form of a screw jack which comprises, in addition to said clamping screw, a hollow body forming a protective housing for receiving and shielding the screw shank and, connected to one end of the housing, an open ended protective casing for receiving and shielding the screw head as well as a key-operated lock mounted therein for cooperation with the screw head for locking the screw against rotation; said protective housing comprises in an upper wall thereof an opening for receiving an end portion of said leg and said hollow body comprises a partition between said housing and said casing, said partition having an opening in a coaxial position relative to the common longitudinal axis of said housing and said casing, said end portion of said leg having a threaded bore for receiving and engaging the screw shank; and wherein the screw shank extends from the casing into the housing through said opening formed in said partition, the end of said hollow body opposite to said casing forming a base adapted to bear against the inboard transom side, the screw head being adapted to bear against said partition and the screw shank extending through and engaging the threaded bore in said end portion of the shank, whereby the screw, when being rotated, urges said bracket leg and thereby the outboard motor forward and said base end of the hollow body backwards against the inboard side of the transom thereby clamping the motor firmly to the transom, and when the screw is then locked, the screw is non-rotatable, shielded and substantially inaccessible and thus safely protected.

4,557,459

LOAD COUNTERBALANCING MECHANISMS

Richard A. Lindsay, Stowmarket, England, assignor to W. Vinten Limited, Bury St. Edmunds, England

Filed Jul. 8, 1982, Ser. No. 396,273
Claims priority, application United Kingdom, Jul. 22, 1981, 8122509
Int. Cl.[4] F16M *13/00*
U.S. Cl. 248—571 **10 Claims**



1. A torque counterbalancing device comprising:
a first spring system having a neutral position which exerts a force in a first direction which force varies in accordance with a variation in length of said first spring system;
a second spring system which exerts a force in a second direction which force varies in accordance with a variation in length of said second spring system; and
a varying means for varying the length of said first spring system and said second spring system in unison, said varying means including
(a) a load bearing platform on which the load to be counterbalanced is located,
(b) a pivot arm attached to said load bearing platform and pivoted about a predetermined point along the length thereof,
(c) a first actuating means to which said pivot arm is connected for varying the length of said first spring system in proportion to the sine of the angular movement of said pivot arm, and
(d) a second actuating means to which said first actuating means is connected for varying the length of said second spring system in proportion to the cosine of the angular movement of said pivot arm,
whereby said first spring system and said second spring counterbalance the torquing load on said load bearing platform as said varying means varies said first and said second springs systems in unison.

4,557,460

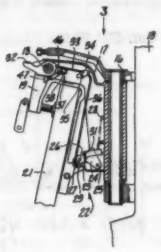
SWIVEL BRACKET HOLDING MECHANISM FOR MARINE PROPULSION DEVICE

Ryoichi Nakase, Hamamatsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed Dec. 23, 1983, Ser. No. 565,208
Claims priority, application Japan, Dec. 25, 1982, 57-226536
Int. Cl.[4] F16M *1/00*
U.S. Cl. 248—642 **8 Claims**

1. In a tilt locking arrangement for a marine outboard drive adapted to be mounted on a transom or the like of a watercraft for pivotal movement about a generally horizontally extending axis from a normal, tilted down running position to a tilted up, out of the water position, reverse locking means movable from a released position to an engaged position for retaining said outboard drive in its tilted down position in opposition to reverse thrust, an operating handle movable from a locked position to a released position, and means for coupling said operating handle to said reverse locking means for moving said reverse locking means between its engaged position and its released position in response to movement of said operating handle between its locked position and its released position, the improvement comprising a tilt locking element movable be-

tween a released position and an engaged position, said tilt locking element being operable when in its engaged position to lock said outboard drive in its tilted up position, and means for interrelating said tilt locking element with said operating handle for retaining said tilt locking element in its released position



when said operating handle is in its locked position and for movement of said tilt locking element to its engaged position upon the placement of said operating handle in its released position and upon the movement of said outboard drive to its tilted up position.

4,557,461

VALVE SEAT

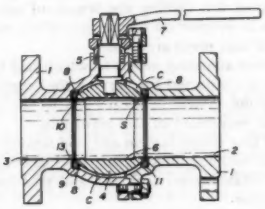
Chikashi Gomi, and Kohichi Hagiwara, both of 2040, Nagasaka Kamijo, Nagasaka-cho, Kitakoma-gun, Yamanashi-ken, Japan

Continuation of Ser. No. 431,075, Sep. 30, 1982, abandoned. This application Jul. 11, 1984, Ser. No. 628,965

Claims priority, application Japan, Jan. 9, 1982, 57-885

Int. Cl.[4] F16K *5/06*

U.S. Cl. 251—172 **3 Claims**



1. A toroidal valve seat for placement in a flow passage, said valve seat being adapted to space a valve casing having a contact surface perpendicular to the flow passage from a ball of a ball valve, so as to form a cavity between the valve casing and the ball, which valve seat comprises:

a shoulder portion provided on one side thereof with a tapered surface which faces the ball and provided on the other side thereof with an engaging surface which contacts the contact surface of the valve casing perpendicular to the flow passage and which has a radially inner edge;

an elastic lip portion integrally formed on the inner circumference of the valve seat, said lip portion having a uniform thickness so as not to make the leading end thereof creep, having its one side coming into partial contact with the ball and having its other side being stepped away from the contact surface of the valve casing perpendicular to the flow passage;

a circumferential non-contact surface projecting from the other side of the lip portion but being stepped away from the contact surface of the valve casing perpendicular to the flow passage;

at least one recess means, being formed in the shaped of a groove in the circumferential non-contact surface without giving any change to the configuration of the leading end of said lip portion, and having its bottom flush with the other side of the lip portion stepped away from the contact surface of the valve casing perpendicular to the flow passage, for relieving excess fluid pressure from between the ball and a part of the lip portion close to the recess means; and

an intersecting portion disposed between the engaging surface of the shoulder portion and the circumferential non-contact surface, said intersecting portion being located on the radially inner edge of the engaging surface of the shoulder portion;

whereby, whenever the valve seat is rotated slightly, an effective sealing function is performed between the intersecting portion and the contact surface of the valve casing perpendicular to the flow passage without bringing about back leakage of a fluid around the valve seat.

4,557,462

ROTARY VALVE ASSEMBLY FOR USE IN REGULATING THE FLOW OF MOLTEN MATERIAL

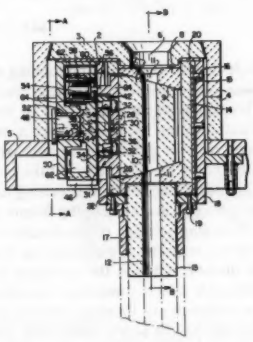
Herbert Bachmann, Adligenswil, Switzerland, assignor to Stopinc Aktiengesellschaft, Baar, Switzerland

Filed Dec. 28, 1983, Ser. No. 566,382

Claims priority, application Switzerland, Jan. 11, 1983, 123/83

Int. Cl.[4] F16K *25/00*

U.S. Cl. 251—184 **21 Claims**



1. A rotary valve assembly for use in regulating the flow of molten material, said assembly comprising:

a stator member having therethrough a flow opening and adapted to be fixed to a source of molten material with said flow opening communicating with such source, said stator member having therein a rotor-receiving opening interrupting said flow opening and defined by a conical bearing surface;

a frusto-conical shaped rotor member extending into said rotor-receiving opening, said rotor member having an outer surface complementary to said bearing surface of said stator member, and said rotor member having extending laterally therethrough a flow opening which, upon rotation of said rotor member with respect to said stator member, may be moved into and out of alignment with said flow opening of said stator member;

power driven means for rotating said rotor member with respect to said stator member, and thereby for selectively regulating the relative degree of alignment of said flow openings;

a housing encasing and fixedly supporting said stator member and rotatably supporting said power driven means for rotation about a fixed axis thereof; and

mechanical clutch means for transmitting rotational torque

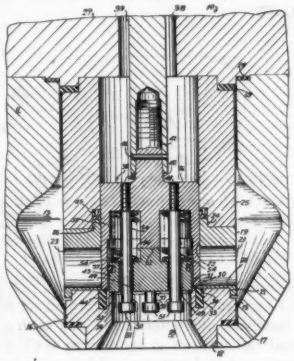
of said power driven means to said rotor member, and for urging said rotor member toward said stator member to ensure sealing engagement between said outer surface of said rotor member and said bearing surface of said stator member, while enabling relative axial, lateral and angular displacements between said rotor and stator members due to thermal expansion and/or contraction thereof.

4,557,463

EROSION RESISTANT SOFT SEATED VALVE TRIM

Dale S. Tripp, Erie, and Timothy E. Kunkle, McKean, both of Pa., assignors to White Consolidated Industries, Inc., Cleveland, Ohio

Filed Apr. 11, 1984, Ser. No. 599,252
Int. Cl.[4] F16K *11/20*
U.S. Cl. 251—210 **2 Claims**



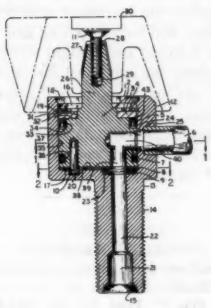
1. A high pressure fluid control valve which comprises
(a) a valve body including an internal flow path defining a fluid inlet and a fluid outlet,
(b) a first valve seat arranged within said internal flow path,
(c) a second valve seat arranged within said internal flow path in a spaced relation to said first valve seat,
(d) a main valve plug comprising integral upper and lower portions,
(e) said main valve plug being selectively, axially movable within said internal flow path and matable with said first valve seat to interrupt fluid flow between the fluid inlet and the fluid outlet, and
(f) a throttle plug axially movable within said internal flow path in a predetermined relative motion with respect to said main valve plug, and matable with said second valve seat to interrupt fluid flow between the fluid inlet and the fluid outlet,
(g) at least the lower portion of said main valve plug including a bore formed therein,
(h) said throttle plug being received in said bore whereby said throttle plug is in a coaxial, telescoping relation with said main valve plug,
(i) said throttle plug being movable relative to said main valve plug within said bore through said predetermined limited distance, whereby during a valve opening operation said main valve plug lifts from said first valve seat before said throttle plug lifts from said second valve seat, thereby throttling initial fluid flow primarily across said second valve seat,
(j) said lower portion of the main valve plug having an outer diameter that is greater than the outer diameter of said upper portion of the main valve plug,
(k) the outer diameter of the upper portion of said main valve plug being substantially equal to the outer diameter of said throttle plug,
(l) at least one fluid flow path being formed completely through said lower portion of the main valve plug whereby fluid may flow from below to above said lower portion of the main valve plug,
(m) at least one flow path being formed completely through the throttle plug and the upper portion of said main valve plug whereby fluid may flow from below the throttle plug to above the upper portion of the main valve plug,
(n) the portions of said internal flow path above the upper portion of the main valve plug being isolated from the portions of said internal flow path which overlie the larger outer diameter lower portion of the valve plug,
(o) whereby fluid leakage across the main valve plug and through the flow path formed through the lower portion of the valve plug will flow to a portion of the internal flow path of the valve body which is isolated from the portions of the internal flow path above the upper portion of the main valve plug, thereby eliminating any unbalanced pressure reversals which may occur due to changes in the exposure of each of the main valve plug and throttle plug to high pressure inlet fluid during a valve opening operation.

4,557,464

PLUG TYPE FAUCET VALVE

John S. Gyurovits, 20 Jay Rd., Chatham Township, Morris County, N.J. 07928

Filed Mar. 27, 1985, Ser. No. 716,547
Int. Cl.[4] F16K *51/00*
U.S. Cl. 251—287 **6 Claims**



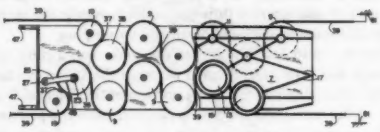
1. The plug type faucet valve for mixing and dispensing hot or cold water, comprising a generally cylindrical body having an inlet port eccentrically located and extending upward through the center of mounting stem where a central cavity having cylindrical inner peripheral surface extending inwardly defined by a planar surface at the bottom wherein a counter bore coaxially spaced to inlet port connecting said cavity thereto, further comprising protective trust bearing means having diameter same as said planar surface and a perforation corresponding to the diameter of said counter bore to receive said inlet seal means therein, also comprise plug valve member having diameter rotatably matched to said cavity and corresponding planar surface at the inner end, and a groove circumferentially cut at the lower end of said diameter to house lower seal therein, said diameter is reduced to provide space for upper seal means thereon, and is further reduced and journaled at the top to provide bearing surfaces for closure means slidably secured thereon, also having a vertical bore extending upward and is spaced to coaxially correspond to said inlet port at the planar surface and a bore radially spaced between said seal means on said diameter extending inward and intersecting said vertical bore therein, forming a passageway through said plug into the coaxially corresponding discharge port through the wall of said cavity.

4,557,465

CABLE DRIVE MECHANISM

Gary W. Lundberg, Federal Way, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Mar. 19, 1984, Ser. No. 591,170
Int. Cl.[4] B66D 1/12, 1/22, 1/26
U.S. Cl. 254—287 20 Claims



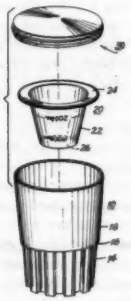
1. A cable drive mechanism comprising in combination:
a frame;
a plurality of independently driven cable wheels and an idler wheel rotatably mounted on said frame;
pivot means pivotally mounted on said frame;
a tension wheel rotatably mounted on said pivot means such that said pivot means may be pivoted to move said tension wheel toward said idler wheel to form a nip therebetween;
a cable member successively wrapped partially around each of said cable wheels and partially around said tension wheel, said cable member further passing through the nip between said tension wheel and said idler wheel and being wrapped partially around said idler wheel in the rotational direction opposite the rotational direction in which it is wrapped around said tension wheel; and
drive means for rotating said tension wheel in a rotational direction opposite the rotational direction in which said pivot means is pivoted to move said tension wheel toward said idler wheel, whereby rotation of said tension wheel induces an angular moment in said pivot means urging said tension wheel against said idler wheel to grip said cable member therebetween.

4,557,466

INERTIAL BARRIER

Stanley Zucker, Suffern, N.Y., assignor to Energy Absorption Systems, Inc., Chicago, Ill.

Filed Feb. 27, 1984, Ser. No. 583,812
Int. Cl.[4] E01F 15/00
U.S. Cl. 256—13.1 13 Claims



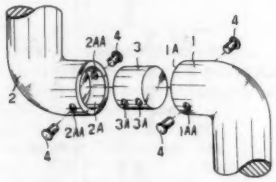
1. Inertial barrier for attenuating the kinetic energy of an errant vehicle to resist the latter's striking a roadway hazard, comprising
a frangible hollow container of generally circular cross section and having upper and lower portions, the lower portion being joined to the upper portion by a substantially annular horizontal ledge intermediate said upper and lower portions, the upper portion having an open top;
an inner core of frangible material and formed substantially as a hollow conic member open at a larger base thereof, with an annular flange at the open base of the conic member, the flange being dimensioned to fit onto and be supported by the ledge of said container;
a sufficient fill of an energy-absorbing granular material; and
a cover to fit the open top of the container with the inner core and the granular material in place in said container.

4,557,467

ELBOW OF STAIRCASE HAND RAIL

Ta C. Lin, 8, 4 La., Pei Jung St., Jen Wu Li, Chiayi City, Taiwan

Filed Aug. 14, 1984, Ser. No. 640,692
Int. Cl.[4] E04H 17/14
U.S. Cl. 256—59 4 Claims



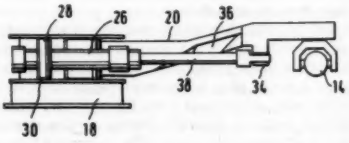
1. An improved elbow of a stairway hand rail comprising two L-shaped hand rail sections, an intermediate means and a plurality of fasteners, characterized in that each of said two L-shaped hand rail sections is terminated with a hollow of smaller diameter and said sections will be united by said intermediate means encompassed within said hollows, and that a pair of symmetrical apertures are provided in said sections in the area of said hollows to cooperate with recesses in said intermediate means to receive said fasteners to secure the resulting elbow.

4,557,468

APPARATUS FOR PLUGGING THE TAPHOLE OF A SHAFT FURNACE

Pierre Mailliet; Léon Ulveling, both of Howald, and Jean Metz, Luxembourg, all of Luxembourg, assignors to Paul Wurth S.A., Luxembourg

Filed Mar. 23, 1984, Ser. No. 592,790
Claims priority, application Luxembourg, Mar. 23, 1983, 84711
Int. Cl.[4] C21B 7/12
U.S. Cl. 266—273 5 Claims



1. A tadpole plugging apparatus comprising:
fixed support frame means, said frame means including a main pivoting joint;
a rotary support arm having upper and lower portions, a first end of said support arm being pivoting mounted on said main pivoting joint;
a clay gun, said clay gun being pivoting attached to a second end of said support arm, said second end being located at a lower portion of said support arm;

hydraulic jack means, said jack means having a piston rod and a cylinder, said cylinder of said jack means mounted on journals in said frame means, said journals being juxtaposed to said main pivoting joint, said piston rod of said jack means pivoting connected to said lower portion of said support arm wherein said piston rod alternately actuates said support arm and wherein said support arm alternatively urges said clay gun to pivot between retracted and operative positions; and

said support arm including a bend portion, said bend portion being fixed in a plane which is substantially parallel to said fixed support frame means, and wherein said bend portion is disposed about said journals when said clay gun is in a retracted position.

4,557,469

WHEEL SUSPENSION SYSTEM

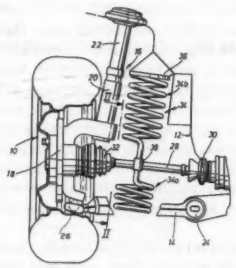
Maximilian Jeglitzka, and Manfred von der Ohe, both of Stuttgart, Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 5, 1984, Ser. No. 586,134

Claims priority, application Fed. Rep. of Germany, Feb. 14, 1984, 3405174

Int. Cl.⁴ B60G *11/16, 15/06*

U.S. Cl. 267—20 A **14 Claims**



1. Coil spring arrangement for vehicle wheel suspension system of the type having:

a wheel control member; and

a wheel suspension system including a coil spring means and a vehicle component disposed adjacent said spring means, said spring means having more than two spring turns,

wherein said spring means is configured to permit said vehicle component to penetrate between said spring turns into the area of an axial projection of said spring means while preventing said component from touching said spring turns as said vehicle component traverses through said axial projection, said coil spring arrangement comprising:

two series connected individual springs forming said coil spring means, which are arranged with mutually facing turn ends supported against each other by way of a bridge member means,

wherein said coil spring means together with said bridge member means are at a spacing from said vehicle component,

whereby said vehicle component can extend uninterrupted through said axial projection formed by said series connected springs.

4,557,470

GAS PRESSURE SPRING WITH A SAFETY DEVICE

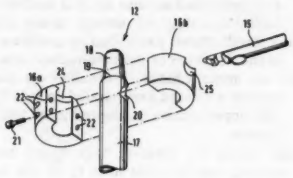
Werner Link, Tieringen, Fed. Rep. of Germany, assignor to Wilhelm Link GmbH & Co. KG, Tieringen, Fed. Rep. of Germany

Filed Nov. 10, 1983, Ser. No. 551,822

Claims priority, application Fed. Rep. of Germany, Jul. 22, 1983, 8321120[U]

Int. Cl.⁴ B60G *11/26*

U.S. Cl. 267—64.12 **9 Claims**



1. A gas pressure spring for a chair, comprising an outer tubular element having a lower portion, an upper end drawn portion of a reduced diameter, and a transition zone between said upper end portion and said lower portion, said tubular element being formed with a lateral opening for receiving therein an end of an adjusting lever operative for adjusting a vertical position of the chair; and safety means surrounding said tubular element near said upper end portion thereof, said safety means including a ring-shaped safety sleeve formed of at least two releasably-connectable portions, which are clamped on the tubular element in the region of said lateral opening and said transition zone, each of the portions of the sleeve having an inner surface being formed with a collar inwardly extending from said inner surface and matching said transition zone and surrounding the same, at least one of said two portions being formed with a through hole for passing therethrough the end of the adjusting lever.

4,557,471

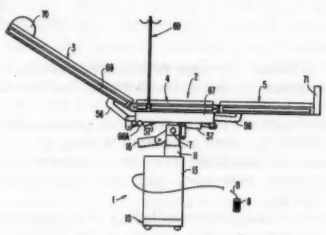
MEDICAL BED

Norbert Pazzini, Villemur sur Tarn, France, assignor to Societe Medi 2000 S.A.R.L., Langon, France

Filed Sep. 16, 1983, Ser. No. 534,626

Int. Cl.⁴ A61G *13/00*

U.S. Cl. 269—325 **17 Claims**



1. A medical bed comprising:

(a) a platform comprising: a plurality of sections, a height, a longitudinal axis having a slope, and a lateral axis having a slope, wherein said sections have a position with respect to each other;

(b) means for adjusting said height of said platform;

(c) means for adjusting said slope of said longitudinal axis of said platform;

(d) means for adjusting said slope of a lateral axis of said platform;

(e) means for adjusting said positions of said sections with respect to each other; and

(f) a support, mounted on said height adjustment means, wherein said longitudinal axis slope adjustment means is mounted on said support, said lateral axis slope adjustment means is mounted on said longitudnal axis slope adjustment means, and one section of said platform is mounted on said lateral axis slope adjustment means wherein said support comprises a beam mounted transverse to said platform, wherein said longitudinal axis slope adjustment means comprises:

(i) a shoe, journalled and mounted on said beam; and

(ii) a motor element adapted to rotate said shoe clockwise and counterclockwise around said beam, wherein said lateral axis slope adjustment means comprises:

(i) a lower chassis journalled on said shoe along a first axis in the direction of the longitudinal axis of said platform;

(ii) an upper chassis, journalled on said lower chassis around a second axis parallel to said first axis, wherein said upper chassis is adapted to be folded on said lower chassis;

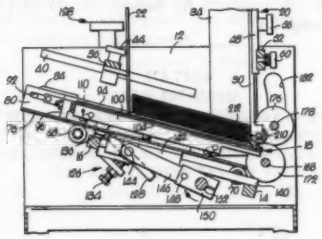
(iii) means for rotating said upper and lower chassis around said first axis so as to tilt the lateral axis of said platform and said bed in a first direction and for rotating said upper chassis around said second axis with respect to said lower chassis, so as to tilt the lateral axis of said platform and said bed in a second direction opposite from said first direction.

4,557,472

MULTI-PURPOSE FEEDER FOR SUCCESSIVELY DELIVERING SINGLE SHEET OR MULTI-LEAVED ARTICLES FROM A STACK THEREOF

Charles N. Hannon, Olathe, Kans., assignor to Stepper, Inc., Olathe, Kans.

Filed Sep. 30, 1982, Ser. No. 431,556
Int. Cl.[4] B65H *3/60*
U.S. Cl. 271—133 **7 Claims**



1. A feeder for single or multisheet articles comprising:

a support adapted to receive a stack of articles in an upright receiving zone thereabove,

said support being reciprocable transversely of the zone in successive feed and return strokes;

means for confining all but the lowermost article in the stack against movement with the support during said feed stroke,

said confining means including an element adjacent the front of said zone with respect to the direction of feed, positioned inwardly from the lateral boundaries of said zone, and having a lowermost surface spaced above said support a distance sufficient to pass only said lowermost article therebeneath; and

an article separator spaced inwardly from the lateral confines of said zone at a level below said element and shiftable from a lowered position at or below said upper surface of the support to a raised, article-engaging position above said upper surface,

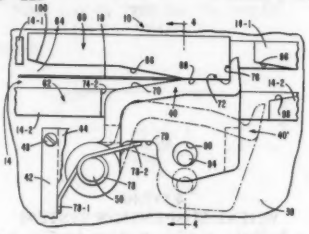
said separator being movable forwardly with said support in timed relationship with raising thereof to said raised position whereby to momentarily warp at least the leading edge of the lowermost article out of its flat plane as that portion thereof aligned with said element slips forwardly under the element while that portion acted upon by the separator is raised at least partially above said lower surface of the element, thereby facilitating separation of the lowermost article from the next adjacent article thereabove as the support completes its feed stroke.

4,557,473

SHEET DECELERATING AND STOPPING APPARATUS

Tadeusz Pecak, Kitchener, Canada, assignor to NCR Canada Ltd. - NCR Canada LTEE, Mississauga, Canada

Filed Dec. 14, 1983, Ser. No. 561,488
Int. Cl.[4] B65H *9/14*
U.S. Cl. 271—229 **4 Claims**



1. A sheet decelerating and stopping apparatus, comprising:

means for feeding a sheet in a feeding direction, said feeding means having spaced first and second walls forming a feeding space therebetween in which said feeding space said sheet is fed, said first wall having a decelerating area thereon;

a member having first and second areas thereon, with said second area being located downstream from said first area with respect to said feeding direction; and

means for moving said member between a first position in which said first and second areas of said member are out of said feeding space, and also for moving said member to a second position in which said first area on said member contacts and cooperates with said decelerating area on said first wall to decelerate said sheet moving towards said second area, against which said second area said sheet is stopped;

said first and second areas of said member being substantially perpendicular to each other, with said second area being substantially perpendicular to said feeding direction when said member is moved to said second position;

said first wall having a deflecting area thereon and said member having a third area thereon which said third area cooperates with said deflecting area when said member is in said second position to direct a sheet between said decelerating area and said first area.

4,557,474

DUPLEX DOCUMENT COPYING MACHINES

James W. Davis, Richardson; Thomas J. DiFloria, Allen, and Larry D. Propst, Rowlett, all of Tex., assignors to The Mead Corporation, Dayton, Ohio

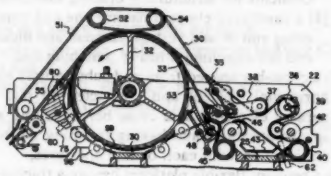
Filed Jun. 21, 1984, Ser. No. 622,813
Int. Cl.[4] B65H *29/54*
U.S. Cl. 271—301 **6 Claims**

1. A copier for sheet documents including a document inverting drum and pressure belts associated with the drum for carrying documents over a surface of a drum, the improvement in apparatus for selectively deliverying such documents for discharge from the drum to an exit region or for inversion by the drum, comprising:

a relatively fixed document stripper blade positioned trans-

versely of surface of the drum in close proximity thereto and underlying said pressure belts adjacent the region of tangency of said belts for separating documents from the surface of the drum, and

a transversely oriented deflector gate positioned adjacent



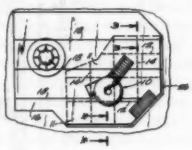
said blade, said deflector gate movable between a first position providing for document movement from said stripper blade to said exit region and a second position in which said deflector gate engages documents exiting said drum at said blade for causing said documents to be diverted in the direction of said drum for inversion.

4,557,475

CUSHIONED ACTIVITY SURFACE WITH CLOSED CELL FOAM PAD BONDED TO HARD SURFACE AND RUBBER MAT

James P. Donovan, 4975 N. Ardmore Ave., Whitefish Bay, Wis. 53217

Filed Jun. 7, 1982, Ser. No. 385,485
Int. Cl.⁴ A63B *71/02*
U.S. Cl. 272—3 **4 Claims**



2. A cushioned play and sport surface for use in areas likely to be impacted by users, comprising,

a hard surface,

a closed cell foam pad bonded to the hard surface, said foam pad being a compound of modified PVC with nitrile rubber,

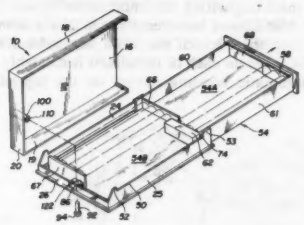
a resilient, cushioned rubber mat bonded to the foam pad, said mat being calendered and vulcanized with a base of polychloroprene rubber and mineral aggregates with stabilizing agents.

4,557,476

CIGARETTE CASE JUGGLERY DEVICE

Hideo Kato, Tokyo, Japan, assignor to Tenyo Co., Ltd., Tokyo, Japan

Filed Jul. 20, 1984, Ser. No. 632,645
Int. Cl.⁴ A63J *21/00;* **E05B** *37/20*
U.S. Cl. 272—8 N **9 Claims**



1. A jugglery device using cigarettes, comprising:

a hollow rectangular parallelpiped casing formed by generally rectangular upper and bottom walls disposed opposite to each other, a pair of side walls connecting opposite side edges of said upper and bottom walls and an end wall by which opposite end edges of said upper and bottom walls are connected to each other;

a drawer assembly disposed slidably in relation to said bottom wall through the open end of said casing and in which a plurality of cigarettes is accommodated, having a bottom wall slidable on the bottom wall of said casing, a pair of side walls formed as vertically raised from the opposite side walls, respectively, of said bottom wall, an end wall formed to cover the open end of said casing and which connects the opposite end edges of said side walls, and a first auxiliary end wall protruding from one of the other opposite end edges of one of said side walls toward the other end edge of the other of said side walls;

a second bottom wall disposed slidably on the bottom wall of said drawer assembly and which is of a nearly same area as the bottom wall of the drawer assembly, in which a pair of second auxiliary end walls are formed as vertically raised from a part of the opposite end edges, one of the second auxiliary end walls touching a part of said end wall of the drawer assembly when said drawer assembly is in the minimum sliding position in relation to the second bottom wall, while the other second auxiliary end wall forms together with said first auxiliary end wall another end wall of the drawer assembly; and first means of releasably engaging said second bottom wall with said drawer assembly and second means of releasably engaging said second bottom wall with said casing, said second means controlling the release of said first means whereby if said second means on manual operation releases said first means only the drawer assembly can be drawn out and if the second means permits locking of said first means then the drawer assembly and said second bottom wall can be drawn out as one unit.

4,557,477

STRIKING DEVICE

Ivan C. Clements, c/o George Spector, 3615 Woolworth Bldg., 233 Broadway, and George Spector, 3615 Woolworth Bldg.,233 Broadway, both of New York, N.Y. 10007

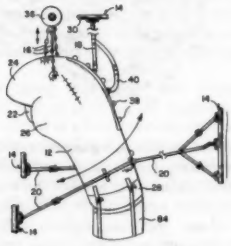
Filed Nov. 14, 1983, Ser. No. 551,602
Int. Cl.⁴ A63B *69/00*
U.S. Cl. 272—76 **3 Claims**

1. A striking bag and support frame which comprises:

(a) a main bag having three heads at the top and a counter balance at bottom;

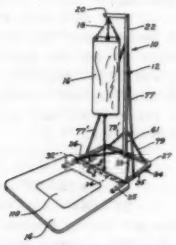
(b) a frame assembly;

(c) means for supporting the main bag within the frame assembly;
(d) means for tilting the main bag forward and rearward within the frame assembly; and
(e) means for stabilizing the main bag within the frame assembly, wherein said frame assembly is triangular in shape having a top cross bar so that the frame assembly can fit into a corner of a room, wherein said means for supporting said main bag within the frame assembly are three chains, each one affixed between the top of the frame assembly and into the back of the main bag behind each of said heads, wherein each of the chains is rotatably mounted to an automatic winding device on the top of said frame



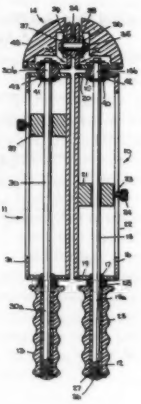
assembly so that said main bag can be raised, lowered and tilted to left side and right side when needed, wherein said means for tilting said main bag forward and rearward comprises:
(a) a plurality of loops mounted in a vertical line on a back surface of said main bag;
(b) an adjustment strap connected between one of said loops and said top cross bar of said frame assembly; and
(c) an auxiliary adjustment strap connected between the middle of said adjustment strap and another one of said loops so that when said adjustment strap is removed from said loop said main bag will drop until the slack is taken up by said auxiliary adjustment strap placing said main bag in a different tilting position.

4,557,478
HEAVY BAG STAND
Norman D. Levine, 2205 NW. 30 Pl., Pompano Beach, Fla. 33060
Continuation-in-part of Ser. No. 346,892, Feb. 8, 1982, Pat. No. 4,482,150. This application May 21, 1984, Ser. No. 612,474
Int. Cl.[4] A63B *69/00*
U.S. Cl. 272—78 **7 Claims**



1. A portable knockdown boxing exercising equipment comprising:
(a) a stand for selectively mounting in operative position a punching bag, said stand including:
(1) a substantially U-shaped member adapted to be positioned on a floor including a horizontal element and at least two substantially parallel elements disposed perpendicular to said horizontal element and secured thereto,
(2) an elongated element disposed vertical to the floor and secured at one of its ends perpendicularly to said horizontal element substantially in the center thereof,
(3) strut means connected to said horizontal and vertical elements for structurally bracing said elements, and
(4) a cantilever element having one end connected to the other end of said vertical element and means at its other end for attaching a heavy punching bag,
(b) a cross-bar spaced from and substantially parallel to said horizontal element and connected to said substantially parallel elements, said cross bar including a plurality of spaced apertures and having fastening means disposed in conjunction with each of said apertures,
(c) a resilient flexible platform having a thickness capable of flexure under the weight and jumping movement of a user of the equipment, said platform having top and bottom surfaces, a central area, and first and second edges, said platform including spaced apertures at the first edge thereof adapted to overlie said apertures in said cross-bar; and
(d) said fastening means removably securing said platform to said cross-bar with resultant spacing of said first edge above a floor while spacing said second edge above a floor in a cantilever fashion.

4,557,479
ARTICULATED MANUAL EXERCISE BAR
Raul Guibert, 10374 Summer Holly Cir., Los Angeles, Calif. 90024
Filed Jul. 3, 1984, Ser. No. 627,663
Int. Cl.[4] A63B *11/00*
U.S. Cl. 272—122 **5 Claims**



1. An articulated exercise bar comprising:
A. a pair of rotatable arms each having a handle at one end; and
B. a rotatable hinge assembly joining together the other ends of the arms and including a pair of hinges each having an inner and outer leaf, the inner leaves being coupled to the other ends of the arms, the outer leaves being coupled together in parallel relation by a common bearing to permit rotation of the hinges relative to each other on a common axis, said inner leaves being nominally in a straight-line relationship to each other and perpendicular to said outer leaves, whereby the arms may be initially held by a user gripping the handles thereof in parallel relation and then swung in and out in a common plane in

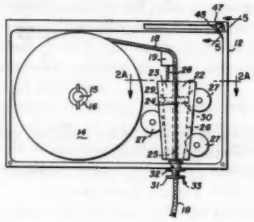
a V-formation or swung in and out with a scizzor-like motion in a direction normal to the common plane, the bar when the arms are in a V-formation being rotatable between the hands of the user about the wrists to rotate the entire bar with a circular motion in space.

4,557,480

PORTABLE EXERCISE DEVICE

Edmond R. Dudley, Saratoga, Calif., assignor to In-Door Gym, Los Gatos, Calif.

Filed Oct. 13, 1983, Ser. No. 541,523
Int. Cl.[4] A63B *21/00*
U.S. Cl. 272—133 3 Claims



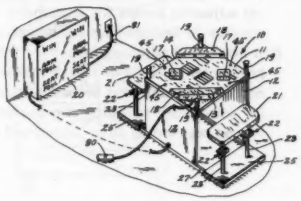
1. A portable resistive type exercise device comprising;
a hollow rectangular housing having a circular aperture formed therein to permit passage therethrough of a cord;
a spring loaded reel mounted within the housing;
a length of cord having a circular cross-section, and including a first terminal end attached to the reel, a second terminal end extending through said aperture, and an intermediate portion wound around the reel;
a first and second trapezoidal-shaped friction block slidably mounted within the housing to have a longitudinal direction of motion, each block having a first flat face containing a central longitudinal groove for receiving the cord and an opposing second flat face with a central longitudinal slot for receiving a roller, said first flat faces and said second flat faces describing intersecting planes, the friction blocks being mounted such that said central longitudinal grooves are parallel and made to describe a circular aperture through which the cord may pass in frictional contact with the blocks, the blocks being aligned such that a widest portion of the blocks is distal to said aperture and a narrowest portion of the blocks is proximal to said aperture, the blocks being slidably interconnected by a pin extending from the first block and slidably mating with an aperture formed in the second block, the first block further including a biasing means formed thereto to initiate said frictional contact between the blocks and the cord;
a plurality of rollers rotatably secured to the housing and slidably engaged with said longitudinal slots of the first and second blocks, the rollers being positioned to urge the blocks into compressional contact with the cord as the cord is drawn out through said aperture and as the blocks are urged by said cord toward said aperture;
guide means for directing the cord from the reel through said central longitudinal groove of the friction blocks;
a tension adjusting means for controlling the amount of travel of the first and second friction blocks, the tension adjusting means comprising a hollow bolt threaded through said aperture of the housing whereby the cord may pass therethrough, said bolt abutting the friction blocks about said longitudinal direction of motion to restrict said longitudinal motion and thereby the amount of compression exerted on the cord whereby the blocks exert a constant and fixed amount of tension on the cord at any given setting of the tension adjusting means, the blocks including sufficient contact area to provide resistance to the outward motion of the cord;
mounting means for mounting the housing to a fixed object; and
exercise interface means to allow a user to couple various muscle groups to the cord whereby said muscle groups may be exercised.

4,557,481

ARM WRESTLING TABLE

Randy L. McClure, 812 Wood St., Eldon, Iowa 52554

Filed Nov. 30, 1984, Ser. No. 676,853
Int. Cl.[4] A63B *21/02*
U.S. Cl. 273—1 GC 4 Claims



1. An arm wrestling apparatus comprising:
a frame having a first end, a second end, a first side, a second side, a top and a bottom;
means operably attached to said frame for supporting said frame in an elevated position;
first pad means operably attached to the top of said frame for receivably supporting an elbow of a first person positioned near said first end of said frame, said first pad means being positioned nearer to said first end and said first side of the frame than to the second end and the second side thereof respectively;
second pad means operably attached to the top of said frame for receivably supporting an elbow of a second person positioned near said second end of said frame, said second pad means being positioned nearer to said second end and said second side of the frame than to the first end and second side thereof respectively;
means associated with said first pad means for indicating when the first person's elbow is lifted off of the first pad means and means associated with said second pad means for indicating when the second person's elbow is lifted off of said second pad means;
means for selectively and independently adjusting the vertical level of said first and second pad means;
means for selectively and independently adjusting the distance of said first and second pad means from a center line of the frame which extends between the ends thereof and intersects the sides thereof and which defines an imaginary boundary line between two halves of the frame;
first target means operably disposed on top of said frame for abutting with the hand of said second person for determining when said first person has won an arm wrestling contest, said first target means being positioned nearer to said first end and said second side of the frame than to the second end and first side thereof respectively;
second target means operably disposed on top of said frame for abutting with the hand of said first person for determining when said second person has won an arm wrestling contest, said second target means being positioned nearer to said second end and said first side of the frame than to the first end and second side thereof respectively, whereby the loser's arm will be bent backwardly in a safe direction conforming to a natural bending action for human arms;
first electric means associated with said first target means for indicating that the first person has won when the first person forces the hand of the second person against the first target means and second electric means associated with said second target means for indicating that the

second person has won when the second person forces the hand of the first person against the second target means;

first seat means disposed adjacent to said first end of said frame for seating the first person, and second seat means disposed adjacent to said second end of said frame for seating the second person;

means associated with said first seat means for indicating when the first person is no longer sitting on said first seat means and means associated with said second seat means for indicating when the second person is no longer sitting on said second seat means;

first vertical adjusting means for selectively adjusting the vertical position of said first seat means and second vertical adjusting means for selectively adjusting the vertical position of said second seat means; and

first horizontal adjusting means for selectively adjusting the horizontal distance of said first seat means from the first end of the frame and second horizontal adjusting means for selectively adjusting the horizontal distance of said second seat means from the second end of the frame.

4,557,482

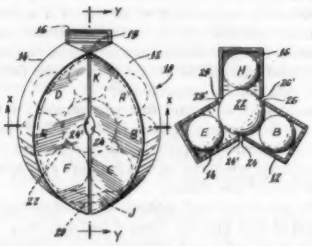
PUZZLE COMPRISING INTERCONNECTED ARCUATE CHANNEL MEMBER

Peter S. Wharton, 4 Gordon Pl., Middletown, Conn. 06457

Filed Nov. 8, 1984, Ser. No. 669,467

Int. Cl.[4] A63F *9/08*

U.S. Cl. 273—109 **18 Claims**



10. A puzzle comprising:

a plurality of transparent hollow arcuate members disposed substantially symmetrically about a substantially spherical core and forming therewith a series of channels of substantially uniform cross-section which interconnect with one another at two locations disposed on substantially diametrically opposed sides of said spherical core;

support means associated with each of said locations of interconnection and adapted to maintain the longitudinal axes of said channels in a vertical plane when either of said support means is resting on a horizontal surface;

a plurality of spherical puzzle pieces of substantially uniform size distributed in surface to surface contact throughout all of said channels, said spherical puzzle pieces having a diameter less than that of the cross-section of said channels but sufficiently large to prevent any two such pieces passing each other within a channel; and one of said spherical pieces being located in the uppermost of said locations of interconnection and being supported by contact with the uppermost of said spherical pieces in at least one of said channels when said puzzle is supported on a horizontal surface.

4,557,483

BALL SHOOTING APPARATUS FOR PINBALL GAME MACHINE

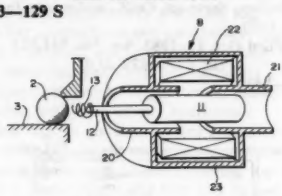
Yutaka Kimura, Osaka, Japan, assignor to Kabushiki Kaisha Universal, Tochigi, Japan

Filed Aug. 24, 1984, Ser. No. 644,130

Claims priority, application Japan, Aug. 24, 1983, 58-129789[U]

Int. Cl.[4] A63F *7/26*

U.S. Cl. 273—129 S **9 Claims**



1. A ball shooting apparatus for a pinball game machine for striking and shooting a ball comprising:

first and second cylindrical stator magnetic poles disposed coaxially with a space therebetween;

a coil supplying said first and second stator magnetic poles with a symmetrical magnetic field;

an envelope of a ferromagnetic material covering said coil and magnetically coupling said first and second stator magnetic poles;

a plunger coaxial with and disposed within said first and second stator magnetic poles, said plunger moving, by a magnetic force generated when said coil is supplied with electrical current, between an advanced position wherein said plunger is on the side of said first stator magnetic pole which is opposite said second pole, an intermediate position wherein said plunger is between said first and second stator poles, and a retracted position wherein said plunger is on the side of said second stator magnetic pole which is opposite said first pole, said plunger striking said ball while said plunger moves toward said advanced position; and

a control circuit supplying a first current for an interval to said coil when said plunger is in said retracted position, said circuit interrupting said first current before said plunger substantially reaches said intermediate position and damping and withdrawing said plunger by supplying a second current for an interval to said coil after said plunger passes through said intermediate position.

4,557,484

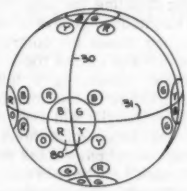
THREE-DIMENSIONAL SLIDING ELEMENT PUZZLE

Benjamin F. Sherman, Jr., 6329 Mori St., and Samuel Francis, 1202 Perry William Dr., both of McLean, Va. 22101

Division of Ser. No. 345,051, Feb. 2, 1982, Pat. No. 4,478,418. This application Sep. 24, 1984, Ser. No. 653,597

Int. Cl.[4] A63F *9/08*

U.S. Cl. 273—153 S **6 Claims**



6. A three-dimensional sliding element puzzle comprising a spherical center support including means forming at least

three crossing tracks wherein each track forms a complete circle in the support and includes a pair of outer lips extending toward each other to define a narrow outer slot and an inner enlarged sliding path,

a plurality of at least eight outer members wherein one of the outer members is fixed on the support and the other outer members are slidable on the support,

legs mounted on the slidable outer members and extending through the narrow slot of the corresponding tracks,

disk-like feet mounted on inner ends of the respective legs for sliding in the inner sliding paths and for being engaged by inner surfaces of the lips to slidingly retain the slidable members on the support,

said outer members forming a shell completely enclosing the spherical support,

said outer members when in one relative position defining at least three pairs of hemispherical shells wherein one hemispherical shell of each pair of the pairs of hemispherical shells is rotatable relative to the corresponding other hemispherical shell, and

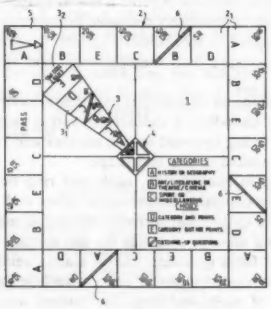
said outer members including sector-like corner pieces on each of the corners of the outer members, each of said corner pieces when aligned in a circular group with three other corner pieces being rotatable to another outer member.

4,557,485

QUESTION AND ANSWER BOARD GAME

Daniel R. Lardon, 413 Marteen St., Banff Alberta (Tol Oco), Canada

Filed Oct. 3, 1984, Ser. No. 657,382
Claims priority, application France, Nov. 7, 1983, 83 17661
Int. Cl.[4] A63F 3/00
U.S. Cl. 273—249 **4 Claims**



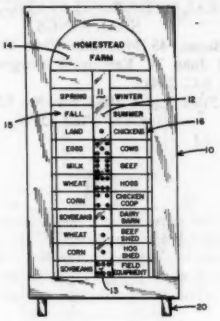
1. Games equipment comprising a board one surface of which is marked with a game track made up of a set of compartments on which the players can move their pieces, the number of compartments moved being determined by dice thrown in succession by each player, also comprising a number of sets of cards bearing questions to which the players must reply, together with answers to these question, each set bearing a mark in a given colour and compartments being correspondingly coloured, the various colours being distributed at random along the compartments, each set of cards being divided into a plurality of groups by numbered references giving points, each numbered reference being reproduced in random order on a compartment so that each compartment defines a set of cards by colour and numbered reference out of which the player must choose one and reply to the question put.

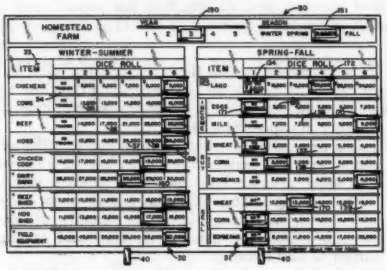
4,557,486

FARM GAME

Jack Stuckmayer, 1102 Delaware Ave., West St. Paul, Minn. 55118

Filed Jul. 16, 1984, Ser. No. 631,390
Int. Cl.[4] A63F 3/00, 9/04
U.S. Cl. 273—278 **1 Claim**





1. A game playing apparatus which promotes simulation of farm managment techniques comprising:

(a) a plurality of cards representing assets of various types;

(b) means for randomly establishing, at various points during the course of the game, a plurality of variables wherein said means include a support stand, a plurality of dice, a faceplate having a first portion through which the dice can be seen and at least one other portion which is subdivided, each subdivision being approximately the same height as a single die and being labeled to identify the subdivision with a particular asset, a dice receiving chamber for aligning and orienting the dice behind the first portion of the faceplate so that only one side of each die is exposed through the faceplate and each die is associated with only one subdivision of at least one other portion of the faceplate, a dice storage and shaker chamber, and an annular opening between the dice receiving chamber and the dice storage and shaker chamber;

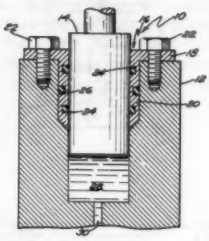
(c) means for displaying the values of at least some of the variables wherein said means include a board having at least one set of x and y axes, one of said axes being divided into six portions and labeled one through six and the other axis being divided into the same number of portions as are dice in the variable establishing means and having the same labels or designations as the subdivisions on the faceplate of the variable establishing means, a plurality of spaces established by the x and y coordinates which are labeled to assign values to the coordinates and a plurality of markers, one for each portion, along one of the axes which are in slidable engagement with the board and

movable parallel to the other axes for designating the proper space defined by the x and y coordinates;
(d) play money for conducting transactions involving the assets; and
(e) means for recording the transactions.

4,557,487
HYBRID SEAL WITH BOTH STATIC AND DYNAMIC SEAL RINGS

Robert M. Banas, 45 Mountain View Dr., Norwich, Conn. 06360, and John W. Kenyon, 3 Sawgrass Rd., Apt. D12, Charleston, S.C. 29412

Filed Sep. 2, 1983, Ser. No. 528,905
Int. Cl.[4] F16J *15/18*
U.S. Cl. 277—12 **5 Claims**

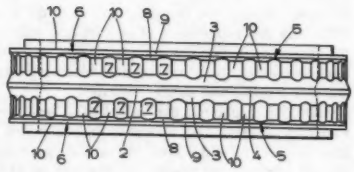


1. In a telemotor system having a housing with an inner cylindrical cavity having oil as an operating fluid and a piston operating on said oil wherein the improvement comprises:
a plurality of cap screws; and
a sealing ring carrier located between said housing and said piston with said sealing ring carrier having a sleeve with two inner grooves and one outer groove, said sleeve further having a flange extending radially from one end of said sleeve, said flange having a plurality of apertures through which said cap screws affix said sealing ring carrier to said housing;
a static seal O-ring inserted in said one outer groove; and
two dynamic quad seal rings with sides having undulations with each of said dynamic seal rings placed respectively in each of said two inner grooves.

4,557,488
HYDRAULIC SEAL WITH PRESSURE-ACTUATED RIDGES

James A. F. Litherland, Sutton Coldfield, England, assignor to Hillman Newby Ltd., West Midlands, England

Filed Feb. 15, 1985, Ser. No. 701,939
Int. Cl.[4] F16J *15/06, 15/14*
U.S. Cl. 277—27 **5 Claims**

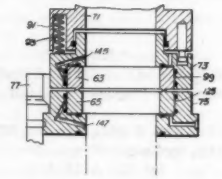


1. A high pressure hydraulic piston seal for sealing a piston to the wall of a cylinder comprising a substantially cylindrical elastomeric body provided with an integral circumferentially continuous, radially outwardly projecting, primary sealing ridge, and on one side of the primary ridge with a web of radially outwardly projecting secondary sealing ridges connecting with the primary ridge at a series of circumferentially spaced positions to define with the primary ridge a plurality of recesses on said one side of the primary ridge to act as fluid reservoirs, the radial height of the secondary ridges being chosen such that at low differential hydraulic pressures acting across the seal, in the direction from said primary ridge towards said one side, fluid in said reservoirs is in communication with the cylinder space on said one side of the seal by way of radial clearance between at least some of the secondary ridges and the cylinder wall, but that at high differential pressures acting in that direction the secondary ridges are pressed radially outwardly into firm sealing engagement with the cylinder wall through elastomeric deformation of the body to isolate the reservoir spaces from one another and from the pressure space on that other side.

4,557,489
PRESSURE BALANCED SEAL

Robert S. Wentworth, Temecula, Calif., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Mar. 23, 1984, Ser. No. 592,494
Int. Cl.[4] F16J *15/34*
U.S. Cl. 277—65 **6 Claims**



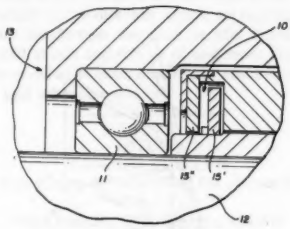
1. A pressure balanced mechanical seal adapted to be placed between a pair of relatively rotatable hollow cylindrical housings and adapted to substantially reduce the leakage of relatively high pressure fluid therebetween, said mechanical seal comprising:
means defining an open-ended cylindrical cavity in each said housing including a cylindrical and a radial wall, said cavities being opposed to one another and being substantially identical in size and shape;
a seal ring in each cavity, each seal ring being arranged generally coaxial relative to the other and having inner and outer cylindrical surfaces and radial end surfaces;
a projecting annular seal face on end surface of each ring, said seal faces opposing and in sealing relationship with one another, and a second annular surface on another end surface of each seal ring, the second annular surfaces being opposed and spaced from each other;
elastomeric means disposed between the outer cylindrical surface of each seal ring and the adjacent cylindrical wall of said cavity for establishing a pressure chamber about each seal ring;
means to expose the inner cylindrical surface and surrounding pressure chamber of each seal ring to said high pressure fluid; and
means to expose said second annular surfaces and substantially equal annular surfaces on the end surfaces of each seal ring to the pressure of a different fluid, the pressure of said different fluid on said second annular surfaces and substantially equal annular surfaces on the end surfaces being substantially equal;
whereby radial and axial pressure differentials on said seal rings are each minimized.

4,557,490

MAGNETIC SEAL SYSTEM FOR BELT CONVEYOR ROLLERS

Luiz M. C. Tavares, Av. Paulista 1106 - 2nd Floor, 01310- Sao Paulo, Brazil

PCT No. PCT/BR83/00008, § 371 Date May 8, 1984, § 102(e) Date May 8, 1984
PCT Filed Sep. 8, 1983, Ser. No. 614,161
Claims priority, application Brazil, Sep. 8, 1982, 8205247
Int. Cl.[4] F16J 15/16, 15/44
U.S. Cl. 277—80 1 Claim



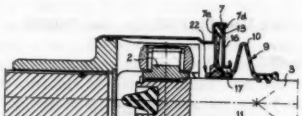
1. A magnetic seal system for bearings of belt conveyor rollers comprising a magnetic radial labyrinth seal (10) disposed between the bearing and ambient to prevent ambient naturally magnetic dust from entering said bearings and wherein the magnetic radial labyrinth (10) is formed by at least a pair of radial rings each defining a permanently magnetized material (15), said rings being axially separated from one another.

4,557,491

SEALING DEVICE INCLUDING A BELLOWS, IN PARTICULAR FOR A TRANSMISSION JOINT

Michel A. Orain, Conflans Ste Honorine, France, assignor to Glaenzer Spicer, Poissy, France

Filed Jul. 31, 1984, Ser. No. 636,248
Claims priority, application France, Aug. 2, 1983, 83 12725
Int. Cl.[4] B61F 15/22
U.S. Cl. 277—212 FB 9 Claims



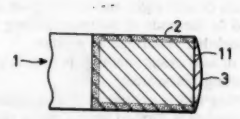
1. A sealing device, in particular for a transmission joint having an inner element connected to rotate with a shaft, an outer element having an axis of rotation and a cap connected to the outer element, the device comprising a bellows of a deformable material connected at one end to said shaft and connected at an opposite end to said cap, the cap defining an annular groove, said bellows including at its end adjacent the cap a heel portion clamped in said annular groove of the cap, said annular groove opening out radially toward said axis of rotation of said outer element and the heel portion constituting the free end of a wall of the bellows which is oriented roughly radially relative to said axis and connected to an opposite end of the bellows by two roughly radial folds.

4,557,492

NITRIDED PISTON RING WITH OUTER LAYER ON SURFACE

Takeshi Tsuchiya; Shuji Samejima, and Tsutomu Kimura, all of Saitama, Japan, assignors to Nippon Piston Ring Co., Ltd., Tokyo, Japan

Filed Feb. 27, 1985, Ser. No. 706,095
Claims priority, application Japan, Mar. 7, 1984, 59-42176
Int. Cl.[4] F16J 9/00; F02F 5/00
U.S. Cl. 277—216 5 Claims



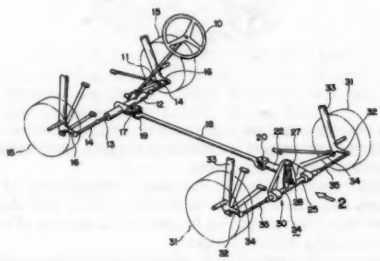
1. A piston ring comprising; a piston ring body formed of one of cast iron and steel, a nitriding layer provided on entire surfaces except an outer peripheral surface of said piston ring body, and one of plating and spraying layer formed on said outer peripheral surface of said piston ring body.

4,557,493

STEERING DEVICE FOR VEHICLES

Shoichi Sano, Tokyo, and Yoshimi Fufukawa, Saitama, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 407,432, Aug. 12, 1982, abandoned.
This application Oct. 5, 1984, Ser. No. 658,078
Claims priority, application Japan, Aug. 12, 1981, 56-127188
Int. Cl.[4] B62D 7/00
U.S. Cl. 280—91 3 Claims



1. A steering device for a vehicle comprising a steering wheel, right and left front wheels, front wheel steering means, right and left rear wheels, rear wheel steering means, a pair of right and left rear wheel steering tie rods for connecting said right and left rear wheels with said rear wheel steering means, and an operating shaft for connecting said front wheel steering means with said rear wheel steering means, said rear wheels being steered along with said front wheels under a steering operation of said steering wheel, characterized in that:

said rear wheel steering means comprises a crank member rotated under rotation of said operating shaft and extending in a radially outward direction of said operating shaft, and a connecting member having the ends thereof respectively connected to inner ends of said right and left tie rods and extending in a width direction of said vehicle while being movable in said width direction of said vehicle;

said crank member and said connecting member are slidably engaged with each other;

said crank member is set in a substantially vertical orientation when said steering wheel is in the neutral position thereof;

whereby, under a rotation of said crank member, said rear wheels are steered in the same direction as that of said front wheels during small steering angle operation of said steering wheel, and during large steering angle operation of said steering wheel, said rear wheels are steered in a direction opposite to that of said front wheels or the steering angle of said rear wheels is reset to zero or near zero;

said connecting member includes a connecting rod having a length directed in the width direction of said vehicle and supported so as to be movable in said width direction of said vehicle;

the inner ends of said right and left tie rods are respectively connected to the ends of said connecting rod;

said crank member is formed as a plate;

an end part of said crank member is fixedly provided with a pin projecting rearwardly;

said connecting rod is provided with a guide member;

said guide member is formed with a guide portion extending in a substantially vertical direction against said connection rod; and

said pin and said guide portion are slidably engaged with each other.

4,557,494

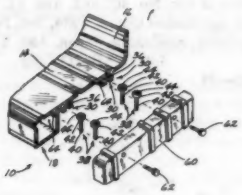
RUNNING BOARD

Dennis L. Elwell, Johnston, Iowa, assignor to Dee Zee Manufacturing, Des Moines, Iowa

Filed Dec. 12, 1983, Ser. No. 560,431

Int. Cl.[4] B60R *3/00*

U.S. Cl. 280—164 R **13 Claims**



1. A running board for a vehicle including a horizontal deck and a transverse support for attaching the deck to the vehicle, the improvement comprising:

a rigid mounting channel extending longitudinally of said deck and attached to the underside thereof, said channel having a bottom opening formed by the spacing of counteropposing support flanges;

a downwardly depending rib disposed within and extending along said channel above said bottom channel opening; and

a fastener including a shaft and a head, said head having a slot formed therein, said fastener being slideable in the longitudinal direction within said channel and disposed such that said rib matingly engages said slot and said shaft depends through said bottom channel opening for attachment to said transverse support.

4,557,495

SAIL RIG FOR BICYCLE

Peter Kindermann, Durch die Aue 1c, 4330 Mülheim, Fed. Rep. of Germany

Filed Jun. 20, 1984, Ser. No. 622,699

Claims priority, application Fed. Rep. of Germany, Jun. 20, 1983, 3322498

Int. Cl.[4] B62B *15/00*

U.S. Cl. 280—213 **11 Claims**

1. In combination with a bicycle having

a frame;

a saddle on the frame;

a front wheel on the frame forward of the saddle; and

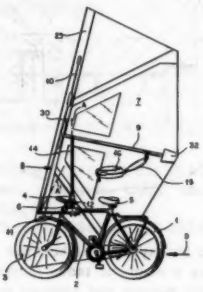
handlebars on the frame and forward of the saddle, the handlebars being connected to the front wheel for pivoting same and steering the bicycle; a sail rig comprising:

an upright yard having a center and upper and lower ends;

a boom extending generally horizontally rearward from the center, having a rear end spaced horizontally therebehind, and forming with the yard a sail frame;

an upright sail spanned over the yard and boom and generally symmetrical to either side of the boom;

a fitting secured to the bicycle frame between the saddle and handlebars and forming a socket between the saddle and the handlebars and a holddown eye forward of the handlebars;



an upright rigid mast secured in the socket and having an upper end;

a swivel joint connecting the mast upper end with the sail frame generally at the yard center;

a halyard having upper and lower ends secured to the respective upper and lower ends of the yard and secured therebetween below the boom to the bicycle frame at the holddown eye, whereby the sail can pivot about an imaginary line through the swivel joint and the holddown eye; and

a sheet extending from the boom rearward of the swivel joint to a rider on the saddle.

4,557,496

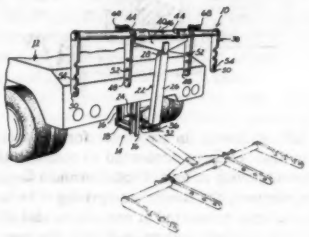
VEHICLE LIFT DEVICE FOR TOW TRUCKS

Marvin S. Sill, P.O. Box 841, 106 E. Elkhart St., Bristol, Ind. 46507

Filed Dec. 14, 1983, Ser. No. 560,898

Int. Cl.[4] B60P *3/12*

U.S. Cl. 280—402 **1 Claim**



1. A vehicle lift device for use in connection with the towing of a disabled vehicle by a towing vehicle, said vehicle lift device comprising frame means for mounting the vehicle lift device to said towing vehicle, a lift arm pivotally mounted to said frame means, means connected between said frame means and said lift arm for shifting the lift arm between a raised

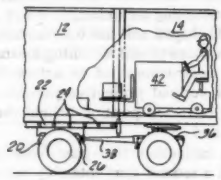
inoperative position and a lowered operative position and a towing position, a beam mounted to the distal end of said lift arm, spaced grids rigidly secured to said beam, said grids each adapted to receive a wheel of said disabled vehicle when said lift arm is in its lower operative position, whereby said disabled vehicle is raised for towing when said lift arm is raised to its towing position, said beam extending transversely of said lift arm distal end and having a bracket, said beam fitting in said bracket in a slip fit for rotational movement about its longitudinal axis, each grid including spaced inner and outer arms rigidly secured at one end to said beam, a pin removably secured across the inner and outer arms at their outer ends for supporting a said wheel of said disabled vehicle on said beam and said pin, a winch mechanism mounted to said beam, and strap means secured at one end to one of said inner and said outer arms and received at its other end in said winch mechanism for retaining a said wheel on said grid.

4,557,497

TANDEM TRAILER

William J. Rumminger, 6103 Salt Lick Cir., Grand Blanc, Mich. 48439

Filed Feb. 22, 1983, Ser. No. 468,703
Int. Cl.⁴ B60D *1/14*
U.S. Cl. 280—403 **9 Claims**



1. A tandem trailer assembly adapted to be pulled by a tractor and comprising:

a lead trailer van having sidewalls, a covering roof, and a door at its rear end;

a pup trailer van having sidewalls, a covering roof, a door at its forward end, and a second door at its rear end;

a rear wall assembly positioned beneath the rear end of said pup trailer van;

a front wheel assembly pivotally positioned beneath the forward end of said pup trailer van;

elongated coupling means extending between said trailer vans with the front end of said coupling means pivotally secured to the rear end of said lead trailer van and the rear end of said coupling means fixedly secured to said front wheel assembly of said pup trailer van; and

means for adjusting the effective length of said coupling means so that the abutting ends of the lead trailer van and pup trailer van may be spaced a relatively large distance from one another so that the trailer vans are free to articulate relative to one another for trailing action or may be closely spaced so that when the adjacent doors of the lead and pup trailer vans are opened, a single enclosed through passage for loading and unloading both of the trailer vans is established.

4,557,498

CROSS COUNTRY SKI BINDING

Gary E. Bernhardson, 4930 Knights Way, Anchorage, Ak. 99504

Filed Apr. 14, 1983, Ser. No. 484,913
Int. Cl.⁴ A63C *9/10*
U.S. Cl. 280—615 **10 Claims**

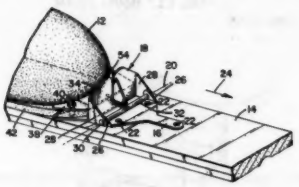
1. A cross country ski binding for connecting a ski boot having a slotted toe plate thereon to a ski, which comprises:

a base plate adapted for mounting on a ski;

the slotted toe plate on the boot including a transverse front wall portion;

a pivot plate parallel upstanding longitudinally spaced apart transverse front and rear portions, the rear portion being adapted for snug receipt in the slotted toe plate on the boot, with the front wall portion of said toe plate being engaged between the front and rear portions of said pivot plate;

the front and rear transverse portions of said base plate including aligned vertical slots therein;



means for hingedly interconnecting said base and pivot plates for relative pivotal movement about a transverse axis; and

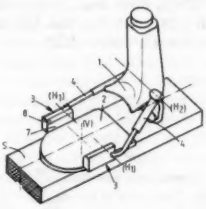
means including a resilient wire clamp associated with said base and pivot plates and movable for selective extension through the aligned vertical slots in the front and rear transverse portions of said pivot plate and into and out of engagement with the toe plate for releasably securing the boot to the binding.

4,557,499

REAR ELEMENT FOR A SKI BINDING

Jean Bernard; Jean Beyl, both of Nevers; Serge Briée, St Pierre le Moutier, and Daniel le Faou, Varennes Vauzelles, all of France, assignors to Ste LOOK, Nevers, France

Filed Nov. 29, 1983, Ser. No. 556,167
Claims priority, application France, Dec. 9, 1982, 82 20626
Int. Cl.⁴ A63C *9/08*
U.S. Cl. 280—626 **5 Claims**



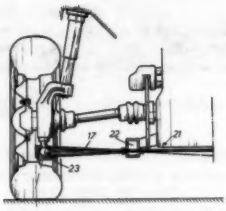
1. A rear ski-binding element comprising a heel-holding member carried by a plate pivoted about an axis at right angles to the top ski face, and a pair of lateral packing members also carried by said plate, said lateral packing members being adapted to cooperate with the sides of the ski boot in order to maintain said boot centered on the ski, wherein each of said packing members has a resilient inner wall which is capable of elastic deformation away from the ski in an outward direction in order to adapt automatically to the width of the ski boot, the inner wall forming an integral part of the packing member, the upper portion of the inner wall extending inwardly and downwardly in order to facilitate positioning of the boot on the ski.

4,557,500

SUSPENSION FOR A MOTOR VEHICLE BY MEANS OF AN ELASTIC BLADE

Maurice Collard, Le Chesnay, and Louis De Goncourt, Voisin Le Bretonneux, both of France, assignors to Bertin & Cie, Plaisir, France

PCT No. PCT/FR81/00150, § 371 Date Jul. 15, 1983, § 102(e) Date Jul. 15, 1983, PCT Pub. No. WO83/01758, PCT Pub. Date May 26, 1983
PCT Filed Nov. 19, 1981, Ser. No. 517,527
Claims priority, application France, Nov. 18, 1981, 81 21569
Int. Cl.[4] B60G *21/04*
U.S. Cl. 280—669 5 Claims



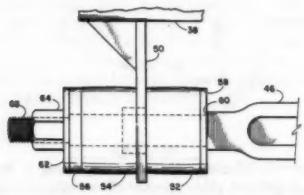
1. An automobile suspension comprising a vehicle chassis, a wheel support, a damper, an elastic leaf having two free ends made of a composite material, and mounting means for mounting said leaf to said chassis; said leaf being fixed by said mounting means spaced from one of said free ends to said vehicle chassis and supporting at said free end said wheel support and said damper, said elastic leaf comprising a first section having a width and a thickness approximately constant and said first section extending approximately in a horizontal plane under said chassis between mounting means, and a second section with a decreasing width and an increasing thickness, said second section extending from said mounting means to the free end, the plane of symmetry of the free end being approximately perpendicular to the horizontal plane; said first and second sections of the leaf having constant and equal cross-sectional areas.

4,557,501

METHOD AND APPARATUS FOR IMPROVING DIRECTIONAL STABILITY OF MOTOR VEHICLES

James R. Farleigh, 728 N. Fifth Ave., Redmond, Oreg. 97756

Filed Jul. 24, 1984, Ser. No. 634,683
Int. Cl.[4] B60G *7/02*
U.S. Cl. 280—673 11 Claims



1. A method for improving the steering stability of a motor vehicle, comprising:

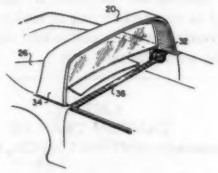
increasing the rigidity of support provided by a resilient radius member bushing included in a mounting for a radius member of a suspension assembly of such a motor vehicle, by placing a flexible spacer including a plurality of parallel layers of cloth, impregnated with and held together by a resilient, rubber-like material, in the space normally occupied by said radius member bushing, in addition to the radius member bushing, so as to increase the amount of force required to move said radius member in a generally longitudinal direction relative to said motor vehicle.

4,557,502

ROLL BAR RETRACTING MECHANISM FOR CONVERTIBLES

Onofrio Scaduto, and Domenico Scaduto, both of 918 Dale Ct., San Marcos, Calif. 92069

Filed Nov. 7, 1983, Ser. No. 548,973
Int. Cl.[4] B60R *21/02;* B60J *724*
U.S. Cl. 280—756 16 Claims



1. A retractable roll bar assembly for an automotive vehicle, comprising:

mounting means for securing to a vehicle chassis and for pivotally mounting a roll bar;

a generally U-shaped roll bar for pivotally mounting in an inverted position to said mounting means for spanning the passenger compartment of an automobile, and pivoting between a vertical protective position and a generally horizontal retracted position behind the passenger compartment; and

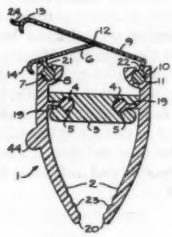
drive means includes a first gear fixed on said mounting means and a second gear rotatably mounted on said roll bar and drivingly engaging said fixed gear for pivoting said roll bar between said vertical and horizontal positions.

4,557,503

BINDING UNIT

Maynard W. Linn, 6336 N. Bergeron, Fresno, Calif. 93704

Continuation-in-part of Ser. No. 362,021, Mar. 25, 1982, Pat. No. 4,493,495, and a continuation-in-part of Ser. No. 454,320, Dec. 29, 1982, Pat. No. 4,524,992. This application Jul. 13, 1984, Ser. No. 630,845
Int. Cl.[4] B42D *17/00;* A44B *19/02;* B42F *15/00*
U.S. Cl. 281—47 25 Claims



1. A binding unit for loose-leaf sheet materials or the like of the type having an open position for insertion and a closed position wherein loose-leaf materials are clamped therein comprising, in combination:

two legs, each of said legs having a free edge and a remote end spaced from said free edge, said free edges having cooperating material-engaging end portions;

a spline;

spline hinge means for coupling each of said legs to said spline in regions adjacent said remote end;

moving means for moving said free edges between said open position thereof and said closed position thereof, said cooperating material-engaging end portion clampingly securing the loose-leaf sheet materials in said closed position, said moving means comprising:

a plurality of first wedges having a first and a second end, said wedges tapering from a first preselected width at said first end to a second preselected width less than said first preselected width at said second end; and

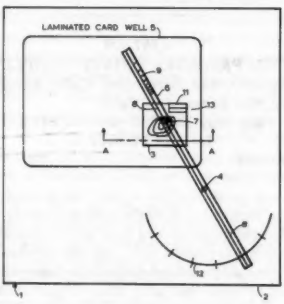
first wedge hinge means pivotally coupling one edge of one of said ends of said first wedge to said spline.

4,557,504

METHOD FOR THWARTING FORGERY OF FINGERPRINT-BEARING IDENTIFICATION MEDIA

Roger J. Kuhns, Tower Rd., Lincoln, Mass.

Filed Jan. 17, 1983, Ser. No. 458,528
Int. Cl.[4] B42D *15/00*
U.S. Cl. 283—68 **13 Claims**



1. A method of verifying the authenticity of an identification card having a fingerprint, including at least one fingerprint discontinuity, recorded thereon comprising the steps of:

a. providing at least one digitizer having a base member, fiducial means movable with respect to said base member, said referencing means for positioning said identification card at a precise predetermined position upon said base member;

b. positioning said identification card at said referencing means;

c. producing relative motion between said fiducial means and said base member until said fiducial means coincides with said fingerprint discontinuity;

d. recording data from said fiducial means indicative of the exact position of said discontinuity with respect to said base member;

e. positioning said identification card at the referencing means of a digitizer substantially identical to said at least one digitizer at a later time;

f. repeating step c; and

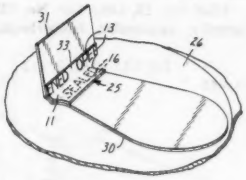
g. comparing the data resulting from carrying out steps e and f with data previously recorded in accordance with steps b, c and d.

4,557,505

STRESS-OPACIFYING TAMPER INDICATING TAPE

Richard M. Schaefer, Bloomington, and James J. Tome, Cottage Grove, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jan. 5, 1984, Ser. No. 568,490
Int. Cl.[4] B65D *41/00*
U.S. Cl. 283—81 **20 Claims**



1. A stress-opacifying tamper indicating tape for use on closures comprising:

a stress-opacifying translucent polymeric backing having an exposed surface,

printed indicium on said exposed surface of a translucent colored ink material,

contrasting indicium on the opposite surface of said backing of contrasting colored ink material and a coating in the background area of said contrasting indicium on said opposite surface, said background coating being of a color substantially similar to the color of said printed indicium,

whereby said contrasting indicium of contrasting color is visible from said exposed side of said backing until said backing is subjected to stress sufficient to opacify said backing and obliterate said contrasting indicium and said background coating to enhance the visibility of said printed indicium.

4,557,506

DUAL-ROTARY UNION, ROTATIONAL ISOLATION ADAPTER

James V. Hanks, Robbinsdale, and Leonid Dayen, Plymouth, both of Minn., assignors to Horton Manufacturing Co., Inc., Minneapolis, Minn.

Filed Jun. 15, 1984, Ser. No. 620,852
Int. Cl.[4] F16L *27/08*
U.S. Cl. 285—39 **20 Claims**

1. In connection with a shaft being rotatable about an axis and having an end and a source of fluid pressure, with the improvement comprising a dual-rotary union, rotational isolation adapter comprising, in combination: a rotary union, with the rotary union including a first fluid communication member in fluid communication with the source of fluid pressure and a second fluid communication member in fluid communication with the first fluid communication member, with the second fluid communication member being rotatable with respect to the first fluid communication member along the shaft rotation axis; an adapter body being substantially dynamically balanced about the shaft rotation axis; means for mounting the rotary union to the adapter body with the second fluid communication member being in the same rotatable position as the adapter body and with the first fluid communication member being rotatable with respect to the adapter body; means for providing fluid communication from the second fluid communication member and externally of the adapter body; and means for rotationally mounting the adapter body about the shaft rotation axis to the end of the shaft for sole support by the shaft allowing the adapter body to be rotationally isolated from the first communication member of the rotary union and simultaneously rotationally isolated from the shaft; wherein the shaft rotationally mounting means comprises, in combination: a pin having a first end and a second end; means for rotatably mounting the pin about the shaft rotation axis adjacent the first end to

the adapter body; and means for removeably connecting the second end of the pin to the end of the shaft.

4,557,507

VERTICAL SPIGOT JOINT

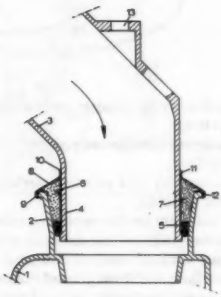
Jacobus J. Commandeur, Beverwijk; Jacob Felthuis, Oudorp, and Piet Mantel, Alkmaar, all of Netherlands, assignors to Hoogovens Groep B.V., Ijmuiden, Netherlands

Filed Sep. 19, 1983, Ser. No. 533,558

Claims priority, application Netherlands, Sep. 30, 1982, 8203795

Int. Cl.⁴ F16L *27/12*

U.S. Cl. 285—45 **12 Claims**



1. A vertical spigot joint between a generally upwardly directed socket and a pipe adapted to fit in said socket, said socket and said pipe defining a space therebetween, said spigot joint comprising:

a sealing ring for sealing said space, said sealing ring extending between said pipe and said socket;

a filler mixture filling said space above said sealing ring, said filler mixture comprising aluminium cement, vermiculite grains, and a plastics material which retains its plastic properties in use;

and a flexible sleeve covering said space, said sleeve being secured to said pipe and said socket so that it is gas tight.

4,557,508

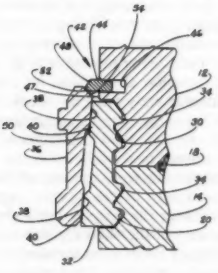
TUBULAR CONNECTOR

Stephen J. Walker, Houston, Tex., assignor to Cameron Iron Works, Inc., Houston, Tex.

Filed Apr. 12, 1984, Ser. No. 599,656

Int. Cl.⁴ F16L *21/08*

U.S. Cl. 285—84 **2 Claims**



1. A tubular connector comprising

a first tubular member having a plurality of external latching grooves around the exterior at a position near one end of said first tubular member,

a second tubular member having a plurality of external latching grooves around the exterior at a position near one end of said second tubular member,

a plurality of latching segments having internal projections spaced for latching engagement with the external grooves of said tubular members to latch said tubular members into latching engagement to each other, said latching segments having external tapered surfaces,

an actuator ring positioned in surrounding relationship to said segments to retain said segments in position around said tubular members and having an internal tapered surface in engagement with the external tapered surfaces of said latching segments whereby movement of said actuator ring in one direction wedges said segments into latching engagement with said tubular members and movement of said actuator ring in the opposite direction releases said segments from latching engagement with said tubular members,

one of said tubular members having an external locking groove spaced from its external latching grooves, and

a split ring positioned in said locking groove and biased in the radial outward direction into engagement with said actuator ring to exert a force on said actuator ring to retain it against movement in both its latched position and its unlatched position,

said split ring having a tapered outer surface which engages said actuator ring to restrain the movement releasing said segments,

said actuator ring having a tapered inner surface which is engaged by said split ring to restrain wedging movement of said actuator ring.

4,557,509

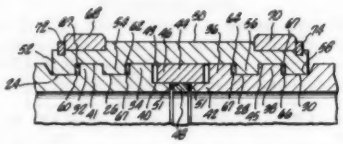
HIGH PRESSURE SWIVEL COUPLING

James F. Giebeler, San Bernardino, Calif., assignor to Emco Arrowhead, San Bernardino, Calif.

Filed May 24, 1984, Ser. No. 613,873

Int. Cl.⁴ F16L *27/00*

U.S. Cl. 285—281 **4 Claims**



1. A high pressure swivel coupling comprising:

(a) a first pipe section, the first end thereof having a uniform exterior diameter and further having formed therein at least two exterior circumferential grooves;

(b) a second pipe section, the first end thereof having a uniform exterior diameter equal to that of said first pipe section, said second pipe section also having formed therein at least two circumferential grooves;

(c) said first and said second pipe sections facing one another in mirror-image fashion and held in place by a split clamp, said split clamp having a first pair of interiorly extending ribs which mate one each with said circumferential grooves on said first pipe section and a second pair of interiorly extending ribs which mate one each with said exterior circumferential grooves in said second pipe section such that the combination of the pipe sections and the split clamps is largely symmetrical about its center point;

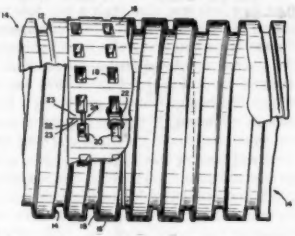
(d) compressible bearing ring within each said exterior circumferential groove on said pipe sections against which each said rib abuts; and

(e) means for holding said split clamp in position on said first and second pipe sections.

4,557,510
CORRUGATED TUBE COUPLING

Stephen R. Overmyer, Francesville, Ind., assignor to Francesville Drain Tile Corporation, Francesville, Ind.

Filed May 9, 1983, Ser. No. 492,798
Int. Cl.[4] F16L *37/14*
U.S. Cl. 285—305 6 Claims



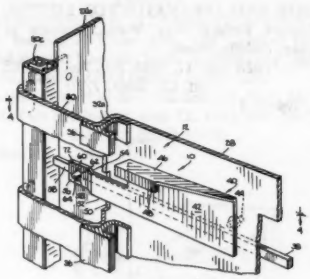
1. A sheet for forming a plurality of coupling bands for connecting the ends of corrugated drain tubes having external grooves, the sheet comprising a plurality of parallel lines of hollow lugs, the lugs being separated from each other by an integral web of plastic material, each line of hollow lugs including a plurality of spaced-apart columns of hollow lugs, each column having in sequence a first end lug formed to include a flat end wall upstanding in substantially perpendicular relation to the plastic web, a plurality of intermediate lugs, and a second end lug formed to include a flat end wall upstanding in substantially perpendicular relation to the plastic web, adjacent spaced-apart columns in each line being arranged end to end to position the flat end walls of the first end lug of one of the adjacent spaced-apart columns and the second end lug of another of the adjacent spaced-apart columns in confronting relation separated by a border area, the columns of each of the parallel lines of hollow lugs being arranged to align said border areas thereby to define a plurality of parallel spaced-apart avenues in the web, the web avenues being aligned in perpendicular relation to the lines of hollow lugs, wherein each coupling band formed in the sheet is defined by at least one transverse cut line situated in one of the web avenues and a pair of laterally spaced-apart slit lines substantially normal to the at least one transverse cut line, the hollow lugs being spaced sufficiently along each of the parallel lines of lugs to permit the coupling band when severed from the sheet to be wrapped around the ends of the corrugated drain tubes and the parallel lines of lugs being spaced apart so that the lugs thereof engage in the external grooves of the two corrugated drain tubes to permit the ends of the tubes to be interconnected by a coupling band of the sheet, and wherein the flat end walls of selected first and second end lugs have apertures formed therein for the reception of coupling band connectors so that such end walls are joinable with coupling band connectors to hold a band severed from the sheet in coupling relation with the tubes.

4,557,511
LATCH ASSEMBLY FOR HOLDING AN OBJECT IN EITHER OF TWO POSITIONS

Robert J. Cohn, Dallas, and John J. Chapko, Wilkes-Barre, both of Pa., assignors to InterMetro Industries Corp., Wilkes-Barre, Pa.

Filed Aug. 1, 1983, Ser. No. 519,320
Int. Cl.[4] E05C *3/14*
U.S. Cl. 292—218 18 Claims

1. A latch and object assembly comprising:
an object mounted for movement between two positions and having two sides;
first catch means mounted in the region of one of said positions of said object;
second catch means mounted in the region of the other of said positions of said object; and
a latch member mounted on said object and having a first latch portion engageable with said first catch means to hold said object in said one position and a second latch portion engageable with said second catch means to hold said object in said other position; said first latch portion including means manipulable from one side of said object to release holding engagement of said second latch portion and said second catch means, and said second latch portion including means manipulable from another side of said object to release holding engagement of said first latch portion and said first catch means;

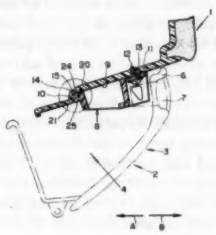


said object further comprising first concealing means for obstructing view of said first latch portion when said object is in said one position, and second concealing means for obstructing view of said second latch means when said object is in said other position.

4,557,512
STRIKER ATTACHMENT CONSTRUCTION

Masashi Miyasaka, Isehara, and Akio Oikawa, Atsugi, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Mar. 22, 1984, Ser. No. 592,021
Claims priority, application Japan, May 20, 1983, 58-74652[U]
Int. Cl.[4] E05C *19/02*
U.S. Cl. 292—341.18 4 Claims



1. A striker attachment construction, comprising:
a member having a shoulder formed with a slit and having slit defining walls defining two parallel sides of said slit;
a striker having one end portion inserted into said slit and an opposite end portion formed with an elongate screw receiving hole; and
a screw extending through said screw receiving hole and threadedly engaged with said member to mount said striker in position on said member;
means integral with and easily removable from one of said member and said striker, said means blocking movement of said striker relative to said member in at least one direc-

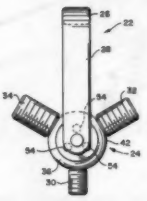
tion parallel to the direction of elongation of the hole when not removed and allowing such relative movement when removed for adjustment of the mounted position of said striker.

4,557,513

METHOD AND APPARATUS FOR LIFTING A BLOCK

John Ferrieri, Federal Way, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Apr. 11, 1984, Ser. No. 598,865
Int. Cl.⁴ B66C *1/10*
U.S. Cl. 294—1.1 **6 Claims**



1. A lifting device adapted to lift an object having a threaded socket for attachment to a threaded male member, said device comprising:

a. a first connecting member having a first connecting portion adapted to be connected to a lifting mechanism such as a hook of a crane;

b. a second connecting member comprising:

(1) a hub portion connected to the first connecting member at a location spaced from the connecting portion for rotation about a first axis;

(2) a plurality of threaded studs, each of which is connected to said hub, with a longitudinal center axis of each said extending radially outwardly from said first axis of rotation;

(3) said hub and said studs being selectively rotatable relative to said first connecting member so that a selected one of said studs can be positioned in a lifting location, with each of said studs having a predetermined diameter differing from another of said studs;

c. said connecting portion of the first connecting member comprising a loop, said loop being positioned in said device so that with a selected one of said studs in said lifting location, the longitudinal center axis of the stud is aligned through the axis of rotation and with the loop, said first connecting member further comprising a pair of legs, with each leg having one end portion connecting to said loop, and a second end portion positioned on one side of the hub, pin means extending between the second end portions of the two legs, said hub being mounted to said pin means for rotation about the axis of rotation;

d. said device futher comprising retaining means interacting between said first and second connecting members arranged to hold each of said studs in its lifting position, with said retaining means comprising a plurality of retaining devices, each of which comprises a retaining element positioned in a related socket of the second connecting member, with compression spring means in the socket urging said retaining element outwardly into an engaged position, said retaining element engaging the first connecting member in retaining engagement at a retaining location;

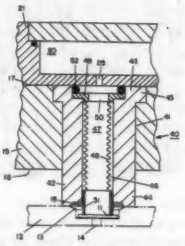
whereby, depending upon the diameter of the threaded socket of the object to be lifted, a stud having an appropriate matching diameter can be utilized to lift the object.

4,557,514

VACUUM PICK AND PLACE ROBOTIC HAND

Robert H. Cushman, Princeton Township, Mercer County, N.J., and Carl L. Hoegermeyer, Buckingham Township, Bucks County, Pa., assignors to AT&T Technologies, Inc., Berkeley Heights, N.J.

Filed Jul. 18, 1984, Ser. No. 632,164
Int. Cl.⁴ B65G *47/91*; B66C *1/02*
U.S. Cl. 294—64.1 **5 Claims**



1. An apparatus for handling an article comprising:

a pickup head having first and second planar surfaces, the pickup head having a cavity formed therein proximate its first planar surface and substantially conforming to the geometry of an article to be handled;

an opening formed in the pickup head for communicatively coupling the cavity with a chamber proximate the second planar surface of the pickup head;

an elongated bellows having a first and a second end portion, said bellows being dimensioned to slide within said opening;

a flange attached to the first end portion of the bellows and having a central aperture communicatively coupled to the chamber; and

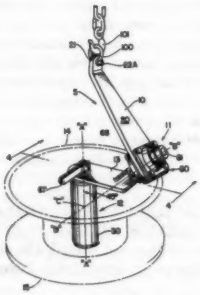
a sleeve attached to the second end portion of the bellows and dimensioned to slidably fit within said opening.

4,557,515

COIL HANDLING DEVICE

Owen R. Read, Glocester, R.I., assignor to Woodlawn Iron Works, Inc., Pawtucket, R.I.

Filed Nov. 8, 1984, Ser. No. 669,597
Int. Cl.⁴ B66C *1/54*
U.S. Cl. 294—67.22 **2 Claims**



1. A coil handling device comprising an arm provided with a bearing mechanism on one end and a bent end having an opening on the other end, adapted to accommodate a lifting mechanism, a spindle plate provided with a cam shaft orifice and a spindle, means fastening said spindle to said spindle plate at an angle of 45° to the horizontal plane of said spindle plate,

means pivotally mounting said spindle within said bearing mechanism, and a jaw mechanism comprising a circular housing, means fastening said circular housing to said spindle plate at a 90° angle to said horizontal plane of said spindle plate, a tube having a hollow area, means fastening said tube to said spindle plate and located within said circular housing, a jaw plate positioned within said circular housing, means fastening said jaw plate to said circular housing, said jaw plate having a left side jaw slot and a right side jaw slot, and with a left side jaw pin passageway and a right side jaw pin passageway, said jaw plate provided with a first bolt orifice, a second bolt orifice and a cam shaft orifice, a first jaw lever having a foot, a ledge and a pivot pin orifice, said first jaw lever located in said left side jaw slot a pivot pin located in said left side jaw pin passageway and pivot pin orifice to pivotally connect said first jaw lever to said jaw plate, a second jaw lever having a foot, a ledge and a pivot pin orifice said second jaw lever located in said right side jaw slot, a pivot pin located in said right side jaw pin passageway and pivot pin orifice to pivotally connect said second jaw lever to said jaw plate, a yoke cam plate slidably mounted within said circular housing and provided with a left side jaw slot and a right side jaw slot, and with a left side jaw pin cam orifice and a right side jaw pin cam orifice, and a cam shaft passageway, said first jaw lever located in said left side jaw slot, a left side cam pin fastened in said first jaw lever and extends into left side jaw pin cam orifice, a right side cam pin fastened in said lever and extends into right side jaw pin cam orifice, a cam shaft fastened in cam shaft passageway, slidably passes through shaft orifice and spindle orifice to project above spindle plate, a coil spring loosely mounted on cam shaft abuts spindle plate on one end and in selected position on cam shaft by means of a collar fastened to cam shaft on the opposite end, a yoke handle pivotally connected to the end of cam shaft moves cam shaft and yoke cam plate up and down against the tension of coil spring, a circular bottom plate provided with relief slots is fastened in the bottom of circular housing by means of bolts fastened in jaw plate and thereby secure tube in position between bottom and jaw plate, and with said first foot and second foot slidably mounted in respective relief slots.

4,557,516

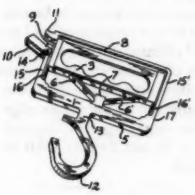
MULTIPLE GARMENT HANGER TRANSFER DEVICE

Daniel C. Usner, 10958 Tanager Trail, Brecksville, Ohio 44141

Filed May 16, 1984, Ser. No. 610,977

Int. Cl.⁴ A47J *51/084, 51/24*

U.S. Cl. 294—143 **5 Claims**



1. A hand-actuated clamping device comprising a main-frame component having a generally rectangular opening therewithin, one leg of said main frame comprising a palm-engaging member, a combination finger-engaging and clamping member slidably mounted within said rectangular opening of said main frame, and disposed to engage and contact in clamping relationship a leg of said main frame opposite said palm-engaging member, spring means constantly urging said finger-engaging member into snug, clamping contact with the opposite leg aforesaid, an opening in one or the other legs of said main frame which maintain said palm-engaging member and the leg opposite thereto in spaced juxtaposition, said opening adjacent said opposite leg, a locking latch for closing said opening, said palm-engaging member also having hook means affixed thereto, said hand-actuated clamping device adapted to be grasped by one hand and further adapted, by squeezing said palm-engaging and finger-engaging members toward each other, to thereby disengage said spring-urged, finger-engaging and clamping member, away from said opposite leg, and by relaxing said hand, said finger-engaging and clamping member are urged back in to firm, clamping contact with said opposite leg by said spring means.

4,557,517

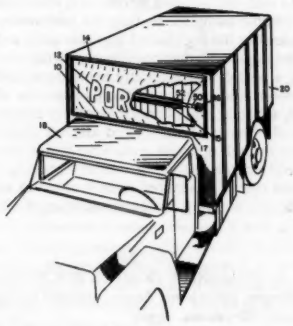
AERODYNAMIC ILLUMINATED SIGN

Richard M. Bolduc, 97 Union Ave., Old Orchard Beach, Me. 04064, and Paul R. Lagarde, South Berwick, Me., assignors to Richard M. Bolduc, Old Orchard Beach, Me.

Continuation-in-part of Ser. No. 330,461, Dec. 14, 1981, abandoned. This application Aug. 22, 1983, Ser. No. 525,180

Int. Cl.⁴ B62D *35/00*

U.S. Cl. 296—1 S **5 Claims**



1. An improved rear illuminated indicia-carrying aerodynamic deflector for mounting on a truck body comprising:

a dome member formed with a lip therearound;

a lip formed around said dome member;

indicia imprinted on the inside of said dome;

a translucent coating applied over the inside of said dome covering said indicia and the remainder of the inside of said dome;

a retaining frame positioned around the lip of said dome;

means to affix said retaining frame to the lip of said dome;

a gasket member positioned around the rear of the lip of said dome;

said retaining frame adapted to be affixed to the front of said truck body;

means to retain said retaining frame and attached dome to the front of said truck body;

illumination means comprising;

a bracket member affixed to said truck body behind said dome having an open-fronted slot defined therein;

a slide bar adapted to slide in the slot of said bracket member;

a plurality of light members, each having light bulbs therein affixed to said slide bar;

means to carry electric current to said light members;

an aperture defined in the side of said dome aligned with said slide bar; and

a covering adapted to be removably and replaceably affixed over said aperture, said slide member being adapted to slide through said aperture when said covering is removed carrying with it said light members causing them to pass out through said aperture to the exterior of said dome where said light bulbs can be replaced if desired, said slide member then being slid back in said bracket in said dome and said covering being reaffixed over said aperture.

4,557,518

MODULAR CONCEPT IN CAMPER TRAILER HAVING PORTABLE CORRIDOR

Ewen M. Maclean, and George Spector, both c/o 3615 Woolworth Bldg., 233 Broadway, New York, N.Y. 10007

Filed Feb. 25, 1976, Ser. No. 661,411
Int. Cl.[4] B60P 3/34
U.S. Cl. 296—156 **2 Claims**

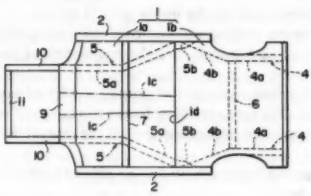
1. A camper trailer, comprising a trailer unit having a portal in combination with means attachable to the unit forming an extension to said unit via said portal, said extension providing additional useable living space, wherein said means comprise a corridor assembly having spaced opposite sides and a passageway therethrough in further combination with a second trailer unit having a portal, said assembly being detachably mounted to and between said units with the passageway aligned with said portals, wherein said corridor assembly comprises opposing U-shaped channels with spaced aligned transverse openings formed through opposite transverse flange portions of the channels, said portals including similar opposing frames surrounding said openings adapted to be secured to said channels with said flanges abutting the outer surfaces of said frames.

4,557,519

AUTOMOBILE BODY STRUCTURE

Osamu Matsuura, Hiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan

Filed Jan. 18, 1983, Ser. No. 458,884
Claims priority, application Japan, Jan. 27, 1982, 57-11966
Int. Cl.[4] B62D 23/00
U.S. Cl. 296—204 **13 Claims**



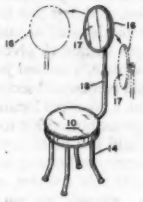
1. An automobile body structure comprising a first pair of closed cross-section structures formed by a lower face of a rear floor panel of a body floor and a pair of rear frame members, each having a forward extension, joined to said lower face of said rear floor panel, each of said first pair of closed cross-section structures extending in the longitudinal direction of the body on a respective side thereof, and a second pair of closed cross-section structures formed by a lower face of a front floor panel of said body floor and a pair of front frame members, each having a rearward extension, joined to said lower face of said front floor panel, each of said second pair of closed cross-section structures extending in the longitudinal direction of the body on a respective side thereof, each of said rear frame members being joined at the forward extension thereof to a respective side sill at a respective side portion of said body floor forward of a respective rear wheelhouse, each of said rearward extensions of said front frame members having a first portion vertically overlapping with a respective forward extension of a rear frame member and joined thereto and a second portion directly joined to said respective side sill substantially in front of the joint between said respective forward extension of a rear frame member and said respective side sill.

4,557,520

CHAIR WITH MOVING SEAT AND MOVING MIRROR

Luther G. Simjian, Fort Lauderdale, Fla., assignor to Command Automation, Inc., Fort Lauderdale, Fla.

Filed Sep. 18, 1984, Ser. No. 651,756
Int. Cl.[4] A47C 7/62
U.S. Cl. 297—185 **6 Claims**



1. A chair comprising:

a rotatable mechanism including at its top a rotatable seat mounting plate, at its bottom a stationary leg mounting plate, a rotatably mounted impeller drum disposed between said seat mounting plate and said leg mounting plate for causing responsive to said seat mounting plate being rotated in one direction said drum to be rotated in the opposite direction;

a mirror support arm secured with one end to said drum for motion therewith, said arm radially extending from said rum underneath said seat mounting plate rearwardly thereof into an upwardly curved portion and continuing in a vertically direction portion, and including at its upper end a mirror mounting means for securing thereto a mirror adapted to be driven in angular motion about a substantially vertical axis;

a cam, and cam follower means including a flexible shaft one end of said shaft connected to said mirror mounting means and the other end of said shaft connected to said cam follower means, for coupling said drum to said mirror mounting means for causing, responsive to the rotation of said seat mounting plate and concomitant counterrotation of said arm, the face of a mirror mounted to said mirror mounting means to be moved for assuming a position substantially tangential to a circle having its center located forward of the axis of rotation of said seat mounting plate,

said cam being of channel shaped configuration and secured inside the wall of said drum and disposed at an angle to rise from a position adjacent to the lower edge of said wall to a position adjacent to the upper edge of said wall, and

said cam follower engaging said channel shaped cam and causing rotation of said flexible shaft in response to rotation of said drum.

4,557,521

CHAIR HAVING A RESILIENTLY INTERCONNECTED SEAT AND BACK

Gerd Lange, Kapsweyer, Fed. Rep. of Germany, assignor to Gebr. Thonet GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 24, 1982, Ser. No. 444,070
Claims priority, application Fed. Rep. of Germany, Dec. 7, 1981, 3148393; Oct. 26, 1982, 3239634
Int. Cl.[4] A47C 5/12, 7/44
U.S. Cl. 297—285 **22 Claims**

1. Seat furniture having a seat portion, a support frame for supporting the seat portion, and a back portion located rearwardly of said seat portion, comprising:

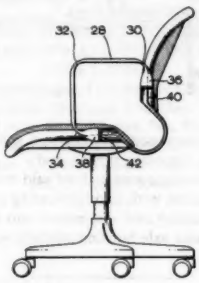
U-shaped means for resiliently interconnecting said seat portion with said back portion,

said interconnecting means comprising

a first leg having a width corresponding to the width of the back portion

a second leg having a width corresponding to the width of said seat portion, and

means, unitarily joining said first leg with said second leg, for preventing movement of the back portion downwardly when rearwardly directed forces are applied to said back portion, said preventing means having a semi-circular cross-section,



each of said first and second legs having a first portion connected tangentially with said preventing means and extending parallel with one another, and a second portion unitary with said first portion which diverges from, and extends substantially at right-angles to, said first portion, and

each of said first and second legs second portions extending coextensively with said back portion and said seat portion, respeotively.

4,557,522

VEHICLE SEAT

Yasuo Isikawa, Akishima, Japan, assignor to Tachikawa Spring Co., Ltd., Japan

Filed Dec. 6, 1983, Ser. No. 558,530

Int. Cl.⁴ A47C *7/02*

U.S. Cl. 297—452 **4 Claims**

1. A vehicle seat comprising:

a cushion member having an upper surface and opposing pairs of side surfaces, said opposing pairs of side surfaces defining an upper peripheral edge together with said upper surface;

a cover member covering said upper surface and said opposing pairs of side surfaces of said cushion member, said cover member including a top portion for covering said upper surface and gore portions for covering said opposing pairs of side surfaces, said top and gore portions being united with one another along a seam portion in registry with said peripheral edge; and

locating means for locating said seam portion in registry with said peripheral edge, said locating means including plural marking means spaced apart along said peripheral edge for marking the correct placement of said cover member relative said cushion member, and plural means defining locating portions, integrally associated with said seam portion at spaced positions, each said locating portion being in registry with a respective one of said marking means for superjacently positioning said seam relative said peripheral edge.

4,557,523

AUTOMATIC SEAT BELT DEVICE

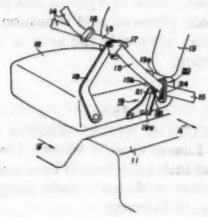
Masanao Motonami; Makoto Yamada, and Hisashi Ogawa, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Jun. 27, 1983, Ser. No. 508,157

Claims priority, application Japan, Feb. 21, 1983, 58-24053[U]

Int. Cl.⁴ A62B *35/00*

U.S. Cl. 297—468 **7 Claims**



1. A seat belt guide comprising:

a bracket mounted to a side surface of a seat and having a portion extending substantially laterally of the seat; and

a seat belt guide ring pivotably secured to said laterally extending portion of said bracket for rotation in a plane substantially lateral to said seat, and having a slot formed therein for guiding a seat belt.

4,557,524

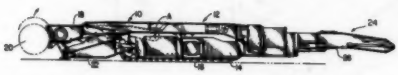
MINING MACHINE DUCT WORK ARRANGEMENT

James J. Melhuish, Franklin, Pa., assignor to Joy Manufacturing Company, Pittsburgh, Pa.

Filed Oct. 31, 1983, Ser. No. 547,152

Int. Cl.⁴ E21F *1/06;* E21C *27/24*

U.S. Cl. 299—64 **13 Claims**



1. A mining machine comprising a vehicle body with a first end thereof having a boom pivoted for up and down swinging movement about an axis extending transversely of the vehicle, a cutter head carried by said boom, and means for carrying away material cut by said cutter head, a conveyor extending longitudinally of the vehicle for conveying material towards a second end of the vehicle, said cutter head when operated to cut causes dust to be present in the air at said first end of said vehicle said machine have a dust control system associated therewith including a duct work system, said duct work system comprising:

generally rectangular intake duct section associated with said boom and swingable up and down with said boom;

a generally rectangular fixed duct section extending longitudinally of said vehicle alongside said conveyor;

a transition duct section connecting said intake and said fixed duct sections, said transition duct section having a bottom plate hinged at one end to a bottom plate of said intake duct section and capable of having the end of said bottom plate opposite said hinged end slide on the inner surface of a bottom plate of said fixed duct section thereby sealing

the bottom of said duct system as said boom rotates upwardly and downwardly, said transition section having a top plate hingedly connected to a top plate of said intake duct section and capable of sliding engagement with the outer surface of said top plate of said fixed duct section as said boom rotates upwardly and downwardly thereby sealing the top of said duct system in said transition area;

said transition section having a partial side plate member fixed to said top plate of said transition section and extending downwardly therefrom, said side plates slidingly engaging the side plates of said intake duct section and said fixed duct section in the area of said transition thereby sealing the sides of said duct system in said transition area during said boom rotation; and

partial side portions extending from the lower portion of the side walls of said fixed duct section around said bottom plate of said transition section and the outer side walls of said intake duct section said partial side portions engaging said partial side plates of said transition section thereby sealing the duct system in the area of the sides of said transition section.

4,557,525

CUTTER BIT ASSEMBLY

Gerhard Merten, Lunen; Oswald Breuer, Dortmund; Norbert Hesse, and Bernd Steinkuhl, both of Lunen, all of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Lunen, Fed. Rep. of Germany

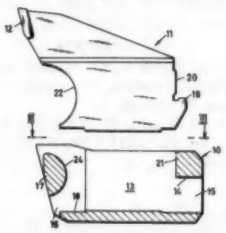
Continuation of Ser. No. 392,363, Jun. 25, 1982, Pat. No. 4,456,307. This application May 14, 1984, Ser. No. 610,116

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1982, 3209410

The portion of the term of this patent subsequent to Jun. 26, 2001, has been disclaimed.

Int. Cl.⁴ E21C *35/18;* **E21B** *10/62*

U.S. Cl. 299—93 **11 Claims**



1. A cutter bit assembly comprising a hollow holder defining an open pocket, a unitary cutter-bit having a shank mounted within the pocket and a cutter edge disposed external to the holder, a gap formed between the shank and an inner face of the pocket over a region of the shank closet in vicinity to the cutting edge of the cutter bit, a rod fixed in the pocket in a position opposite to the gap, a non-resilient locking element tapered to conform to and removably wedged in the gap between the shank and said inner face, aperture means in the holder in the vicinity of the gap for permitting insertion and removal of the locking element, and a curved recess in the shank of the cutter bit opposite the gap which seats on the rod.

4,557,526

WATERPROOF AXLE SYSTEM FOR A BOAT TRAILER

George O. Smith, 117 Bradley St., Carrollton, Ga. 30117

Filed Jul. 6, 1984, Ser. No. 628,439

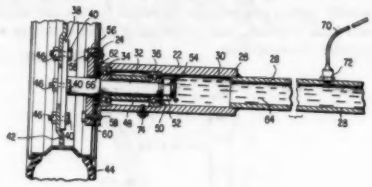
Int. Cl.⁴ B60B *35/04, 35/08*

U.S. Cl. 301—124 R **3 Claims**

1. A waterproof axle system for boat trailers having a frame for supporting a boat comprising:

(a) an elongated tubular axle housing means adapted to be attached to said frame and containing a quantity of lubricating oil,

(b) stub axle means having means for rotatably mounting said stub axle in each end of said axle housing, each of said stub axle means having flange means for attachment to a vehicle tire,



(c) seal means interposed between said stub axle means and said rotatable mounting means, and

(d) means intermediate said ends of said axle housing means in communication with said lubricating oil for preventing water from passing said seal means into said axle housing means when said axle housing means is submerged in said water.

4,557,527

ELECTRO-PNEUMATIC BRAKE SYSTEM

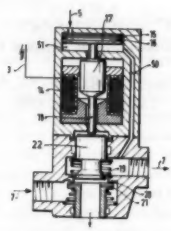
Werner Stumpe, Kornwestheim, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 415,213, Sep. 7, 1982, abandoned. This application Dec. 3, 1984, Ser. No. 676,605

Claims priority, application Fed. Rep. of Germany, Apr. 24, 1982, 3215475

Int. Cl.⁴ B60T *8/02, 13/74*

U.S. Cl. 303—15 **14 Claims**



1. In an electro-pneumatic brake system including at least one storage tank and brake cylinders supplied thereby, which comprises a pressure control valve which controls air passage from said at least one storage tank to the brake cylinders, said pressure control valve including a body having an inlet and at least one outlet, a double-seat valve including a first valve seat on said body between said inlet and said at least one outlet and an axially aligned movable closing body, said movable closing body including a central passage and a second valve seat on an end thereof, a portion of which seats against said first valve seat to separate said inlet from said at least one outlet, an axially aligned attachment within said valve body operable to seat against said second valve seat on said closing body thereby closing said central passage and adapted to move said movable closing body away from said first valve seat, an electro-magnet secured to said valve body, said electro-magnet including an armature with a stem attachment in axial alignment with said attachment which exerts a force on said movable closing body for directly controlling said movable closing body in accordance with an electrical current applied to said electromagnet, and a compressed air operating piston means in axial alignment

with said armature, said piston means including an axially aligned stem and operative to exert a force on said armature for movement of said armature relative to said attachment and said movable closing body of said double-seat valve in the event said electromagnet is inoperative whereby said double seat valve is operated by said armature by application of an electrical current to said electro-magnet and in the event said electrical current is inoperative, said compressed air operated piston will physically move said armature for operation of said double-seat valve.

4,557,528

HYDRAULIC VEHICLE BRAKE SYSTEM WITH BRAKE FORCE AMPLIFICATION AND ANTI-SKID REGULATION

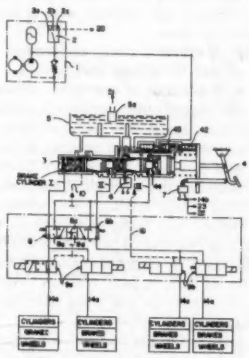
Heinz Leiber, Oberriexingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 15, 1983, Ser. No. 552,200

Claims priority, application Fed. Rep. of Germany, Nov. 26, 1982, 3243789; Mar. 9, 1983, 3308281; Nov. 4, 1983, 3339901

Int. Cl.⁴ B60T *8/02*

U.S. Cl. 303—92 **30 Claims**



1. A hydraulic brake system providing brake force amplification and anti-skid regulation for wheel brake cylinders of wheel brakes at each wheel of a vehicle, comprising:

at least one closed brake circuit having a main brake cylinder means, a fluid pressure source therefor providing a braking pressure fluid, a pilot fluid pressure derived from the fluid pressure of said fluid pressure source, and a pedal-actuated member for controlling said pilot fluid pressure,

at least one anti-skid regulating valve means connected between said main brake cylinder means and said wheel brake cylinders of the wheels of said vehicle for regulating the braking fluid pressure during braking and upon a tendency to skidding of the wheels of said vehicle,

a valve assembly means for selectively providing said pilot fluid pressure as a different fluid pressure source effective for said anti-skid regulating valve means, and

triggering means for actuating said valve assembly means at least during anti-skid regulation.

4,557,529

VACUUM INTERRUPTER GUIDE BUSHING RETAINER MEANS

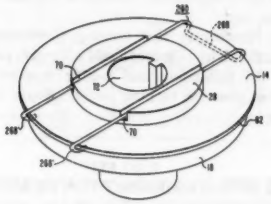
Sidney J. Cherry, and George R. Turner, both of Elmira, N.Y., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 2, 1982, Ser. No. 446,150

Int. Cl.⁴ F16C *29/02*

U.S. Cl. 308—4 R **2 Claims**

1. A contact support rod guide bushing retainer member for securing a contact support rod guide bushing having a first diameter to an end plate closure having a second diameter greater than said first diameter of an insulating envelope of a vacuum circuit interrupter comprising a continuous length of resilient wire shaped to define two substantially parallel sections which terminate in a continuous engaging means at each end thereof, whereby said parallel sections form in part a planar portion which straddles the supports rod and contacts the guide bushing, and said continuous engaging means at each end secure said retainer member to the end plate closure,



positively biasing the guide bushing against the end plate closure and wherein the guide bushing includes an upper surface having an aperture therethrough through which the support rod travels and a pair of substantially parallel grooves in said upper surface which grooves straddle said aperture and are adapted to receive therein at least a portion of said substantially parallel sections of said retainer member whereby rotational movement of the guide bushing relative to the end plate is inhibited.

4,557,530

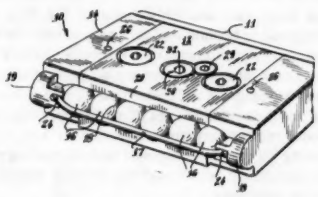
FLAT, COMPACT, LINEAR BALL BEARING WITH WEDGE-LOCKED ECCENTRIC ADJUSTMENT AND REMOVABLE RACES IN CYLINDRICAL SEATS

Harold A. Haase, Taunton Hill Rd., Newtown, Conn.

Filed May 24, 1984, Ser. No. 613,900

Int. Cl.⁴ F16C *29/06*

U.S. Cl. 308—6 C **20 Claims**



6. The linear ball bearing adapted to cooperate with a way member to permit free relative longitudinal movement between said member and said linear ball bearing, said linear ball bearing comprising:

a housing for holding a plurality of movable balls,

said housing defining a front surface adapted to face toward said way member,

said housing defining a closed loop path therein for providing an endless path for recirculation of said plurality of movable balls within said housing,

a straight front channel portion of said path being positioned near the front surface of said housing and the balls being accessible from outside of the housing along said straight front channel of the recirculation path for allowing said way member to be in contact with the balls as they travel along said straight front channel,

said straight front channel being adapted to receive therein at least one removable, wear-resistant, hard, straight, ball-bearing race element for defining a rolling surface

along which said plurality of balls can roll as they travel along said straight channel,

means for removably holding said race element in said front channel,

an eccentric post positioned centrally in said housing perpendicular to the plane of travel of said plurality of balls in said recirculation path within the housing,

said eccentric post being rotatable about its axis for adjusting the pre-loading forces applied to said balls as they travel along said straight front channel in contact with said way member, and

a wedge member in said housing positioned in abutting relationship with respect to said eccentric post, and screw means for tightening said wedge member against said eccentric post for locking said eccentric in its adjusted position.

4,557,531

PULL-OUT GUIDE ASSEMBLY FOR DRAWERS OR THE LIKE

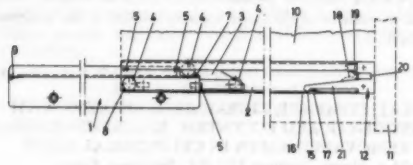
Erich Röck, Höchst, and Helmut Hollenstein, Dornbirn, both of Austria, assignors to Julius Blum Gesellschaft m.b.H., Höchst, Austria

Filed Apr. 13, 1984, Ser. No. 599,827

Claims priority, application Austria, May 3, 1983, 1618/83

Int. Cl.⁴ A47B *88/04*

U.S. Cl. 308—3.8 **7 Claims**



1. In a pull-out guide assembly for use on each of opposite sides of a drawer in an article of furniture of the type wherein the drawer is slidably insertable into and removable from a furniture body, said assembly being of the type including a supporting rail to be mounted on a respective side of the body, a pull-out rail to be mounted on a respective side of the drawer, a roller carrier mounted between said supporting and pull-out rails, load transmitting rollers carried by said roller carrier and running on horizontal flanges of said supporting and pull-out rails, and compensating rollers carried by said roller carrier and running on vertical flanges of said supporting and pull-out rails for providing lateral stability to said assembly, the improvement comprising:

stop means on a front end of said supporting rail and on a rear end of said pull-out rail for preventing disassembly of said supporting and pull-out rails and said roller carrier by relative longitudinal movement therebetween, and thereby for forming said supporting and pull-out rails into an inseparable unit which may be mounted on the respective side of the furniture body;

said supporting and pull-out rails, said roller carrier and said load transmitting and compensating rollers being dimensioned and positioned for relative longitudinal movement substantially without lateral or vertical clearance; and

means for, after said inseparable unit has been mounted on the respective side of the furniture body, connecting said pull-out rail to the respective side of the drawer without the use of screws or bolts, said connecting means comprising a locking member including a resilient latch member having a catch fitting onto said pull-out rail and at least one integral member extending laterally from said locking member for removable friction fit into a hole provided in the respective drawer side.

4,557,532

CURVILINEAR BEARING UNIT

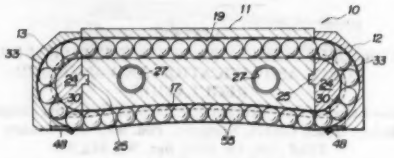
Hiroshi Teramachi, 2-34-8, Higashi-Tamagawa, Setagaya-Ku, Tokyo, Japan

Filed May 11, 1984, Ser. No. 609,085

Claims priority, application Japan, May 11, 1983, 58-80968

Int. Cl.⁴ F16C *29/06, 13/00*

U.S. Cl. 308—6 C **6 Claims**



1. A curvilinear bearing unit, comprising:

a track bae having an arcuate outer peripheral surface having two converging flat surfaces and being provided on said converging flat surfaces with a pair of curvilinear loaded ball grooves;

a bearing block movable along said arcuate outer peripheral surface of said track base and having a curvilinear side surface with a radius of curvature substantially equal to that of said arcute outer peripheral surface of said track base, said curvilinear side surface having two diverging flat surfaces which form an opening having a wide mouth, each of said diverging flat surfaces having a loaded ball groove extending in the longitudinal direction thereof and said bearing block having two non-loaded ball bores formed therein and being spaced from said loaded ball grooves, said two loaded ball grooves in the bearing block being disposed in opposed parallel relation with each other and in face-to-face relation with corresponding loaded ball grooves in said track base with said track base being interposed therebetween;

end plates attached to the opposite longitudinal ends of said bearing block and each having a pair of connection passages formed therein which connect said loaded ball grooves and the corresponding non-loaded ball bores;

a plurality of balls movable along endless ball passages formed by said loaded ball grooves, said connection passages and said non-loaded ball bores; and

a retainer for retaining said balls running along said load ball grooves.

4,557,533

MEDIA STORAGE DEVICE

Richard C. Koch, 14252 Culver Dr., #A187, Irvine, Calif. 92714

Continuation of Ser. No. 501,155, Jun. 6, 1983, abandoned, which is a division of Ser. No. 225,412, Jan. 15, 1981, Pat. No. 4,401,216, which is a continuation of Ser. No. 90,271, Nov. 1, 1979, abandoned. This application Mar. 4, 1985, Ser. No. 707,525

Int. Cl.⁴ A47B *81/06*

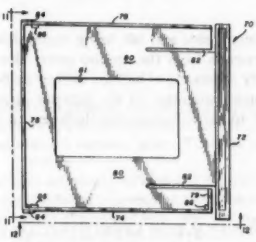
U.S. Cl. 312—12 **2 Claims**

1. A device for storing a plurality of magnetic information storage media comprising:

an exterior housing including opposing right-side and left-side walls, opposing top and bottom walls, and a back wall to frame a front opening of an elongated rectangular shape and included in the interior guide means for receiving and guiding a drawer; and

a drawer for non-removably sliding and fitting within the housing the drawer including a hinged gate means extending across a portion of an opening of the drawer for restraining the contents of the drawer, the drawer comprising a right-side panel, a back wall, a bottom wall, a top wall opposing said bottom wall and a front-piece, said

back, bottom and top walls, and said front piece, extending perpendicularly from and upon said right-side panel to form, with said panel an open, rectangular container, said top and bottom walls further being joined to said back wall, and said back wall enters the housing first, said front piece being flexibly attached to said right-side panel and displaced slightly outward from said right-side panel and from said top and bottom panels, said front piece including a right-side extension, parallel to said right-side panel, said extension adapted to serve as a handle for grasping the drawer, said front piece further including a flange formed about the periphery thereof, said flange being adapted to abut and seal said elongated rectangular opening of the housing when the drawer is fully inserted therein, and said gate means includes a rectangular plate extending across said opening framed by said back, top and bottom walls and by said front piece said plate having a length slightly



less than that of said bottom wall and a height of between one-quarter and one-half the length of said right-side panel, a pair of side pieces secured to said plate and extending perpendicularly into the drawer from the respective ends of said plate, each side piece including a pivot post extending perpendicularly outwardly therefrom and adapted for mating with one of a first and second pair of pivot post apertures formed in the drawer, said first and said second pair of apertures being formed in mutually perpendicular orientations whereby said gate means may be mounted in mutually perpendicular orientations, and said device further includes means for flexibly securing the drawer in a closed position within the housing, the means including a snap lock wedge formed to an outside surface of said right-side panel, said wedge adapted for engaging an interior surface of said housing right-side wall and pivot means adapted for vertically pivoting said drawer when fully extended.

4,557,534

MOBILE STORAGE SYSTEMS WITH LEASH CONTROL

Dean L. Dahnert, Fort Atkinson, Wis., assignor to Spacesaver Corporation, Fort Atkinson, Wis.

Filed Aug. 29, 1983, Ser. No. 527,296
Int. Cl.[4] A47B *53/02*
U.S. Cl. 312—201 **5 Claims**

5. A storage unit system including at least one storage unit that is movable toward and away from another unit,

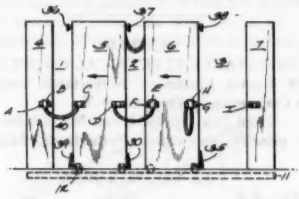
reversible electric motor means on each movable storage unit for driving said unit in two directions,

motor controller means responding to input of a first control signal by causing said motor means to drive said movable unit in one direction and to input of a second control signal by causing said motor means to drive said unit in another direction,

safety sweep bar means on at least one side of said movable unit and sweep switch means operable from a closed state to an open state as a result of said sweep bar means encountering an obstruction during movement of said movable unit in one direction,

circuit means for transmitting said first control signal to said motor controller means, said sweep switch means being connected in said circuit means and operative to inhibit said first control signal when said sweep switch means is open, and

time delay means including time delay switch means in said circuit, said time delay means responding to opening of said sweep switch means by opening said time delay switch



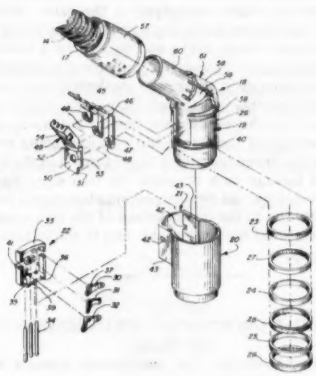
means to further inhibit said first signal when said sweep means is opened, said time delay means responding to reclosure of said sweep switch means by initiating measurement of a predetermined time interval and responding to expiration of said interval by closing said time delay switch means to terminate inhibition of said first control signal.

4,557,535

ELECTRICAL HOSE SWIVEL CONNECTOR FOR CANISTER VACUUM CLEANER

James W. Keane, White Bear Lake, Minn., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Sep. 17, 1984, Ser. No. 651,103
Int. Cl.[4] H01R *39/00*
U.S. Cl. 339—5 R **18 Claims**



1. In a vacuum cleaner having a canister housing defining a suction inlet opening and an electrical power connector adjacent said opening, and a hose for conducting dirt-laden air to said suction opening and provided with electrical power-conducting means, the improvement comprising:

a swivel connector having a first portion secured to said hose end, and a second portion adapted to be removably secured to said housing in said suction inlet opening, said first portion being swivelly connected to said second portion;

an electrical power plug removably mounted to said swivel connector second portion;

first cooperating interlock means on said plug and swivel connector second portion for releasably locking the plug to said swivel connector second portion;

second cooperating interlock means on said plug and swivel

connector first portion for preventing axial separation of said first and second swivel connector portions; and

cooperating electrical connection means on said plug and said swivel connector first portion for electrically connecting said electrical power connector to said electrical power-conducting means with said swivel connector first and second portions in any one of a plurality of different angularly related swivel positions.

4,557,536

ROTATABLE ELECTRICAL COUPLING

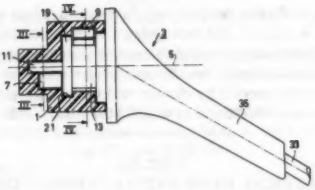
Jan V. M. Geurts, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 12, 1984, Ser. No. 588,466

Claims priority, application Netherlands, Mar. 31, 1983, 8301137

Int. Cl.⁴ H01R *39/08*

U.S. Cl. 339—8 P **2 Claims**



1. A rotatable electrical coupling which comprises a cylindrical housing enclosing two resilient contact members, said housing having a circumferential groove formed in its inner surface; a cable holder having two slip rings respectively cooperating with said two contact members, said slip rings being formed as coaxial cylindrical conductors of different diameters; a connection cable embedded in the cable holder and having two conducting cores, the two slip rings being respectively electrically connected to said two cores; a hollow substantially cylindrical insulating body electrically separating the two slip rings from each other, said insulating body including a disk-shaped member at its end facing the interior of the housing, said disk-shaped member having a diameter greater than the diameter of the larger slip ring and being rotatably journaled in the circumferential groove formed in the housing, an extended leakage path between the two slip rings being thereby provided by said disk-shaped member; means to secure the larger slip ring to the outer surface of the insulating body; and means to secure the smaller slip ring to the interior of the insulating body.

4,557,537

ELECTRICAL GROUNDING ARRANGEMENT AND METHOD

Carl R. Greer, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed May 21, 1984, Ser. No. 612,747

Int. Cl.⁴ H01R *4/42, 4/64*

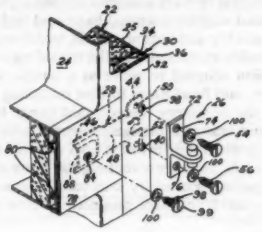
U.S. Cl. 339—14 R **8 Claims**

1. An electrical ground connection arrangement for two metal elements comprising:

a first metal element with an aperture having a periphery and an integral tab with a thickness and extending from the aperture periphery and departing the plane of the first metal element, said tab having a length no greater than the diameter of the aperture,

a second metal element with an aperture having a periphery and a slot radially outwardly of the aperture periphery, said slot having inserted therein the tab of the first metal element, and

an externally threaded metal fastener having a minor and major thread diameter through the first and second metal element apertures which fastener bends the tab in the insertion direction of the fastener through the apertures into the slot of the second metal element, scores the tab of the first metal element and is in metal-to-metal contact with the tab and second metal element,



said fastener, slot and tab being dimensioned such that the slot extends from the second metal element aperture periphery a distance of half the difference between the minor and major diameter of the fastener plus approximately a fourth to three-fourths the thickness of the tab.

4,557,538

ASSEMBLY FOR EFFECTING AN ELECTRIC CONNECTION THROUGH A PIPE FORMED OF SEVERAL ELEMENTS

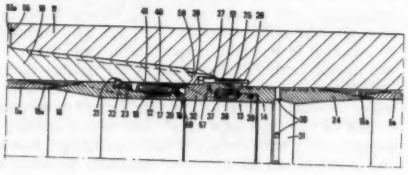
André Chevalier, Pantin, France, assignor to Institut Francais du Petrole, France

Filed Jul. 21, 1983, Ser. No. 515,978

Claims priority, application France, Jul. 21, 1982, 82 12861

Int. Cl.⁴ H01R *4/64*

U.S. Cl. 339—16 C **20 Claims**



1. An assembly for effecting at least one electric connection through one pipe formed of a plurality of pipe elements secured to one another, each pipe element having a first end and a second end, adapted to mechanically cooperate with the complimentary ends of the next elements, characterized in that each pipe element comprises:

a sheath placed inside said element and wherein is housed at least one conductor,

a first connected secured to one end of said sheath which is maintained in the first end of said pipe element and which electrically cooperates with said conductor,

a second connector secured to the other end of said sheath which is maintained in the second end of said pipe element and which electrically cooperates with said conductor,

a double connector having a first end comprising at least one contact and a second end comprising at least one contact, said contacts being electrically connected to one another, the first end of said double connector electrically cooperating with the first connector of an adjacent pipe element, the second end of the double connector electrically cooperating with said second connector, and

means for positioning and fastening said first and second connectors to said pipe element.

4,557,539

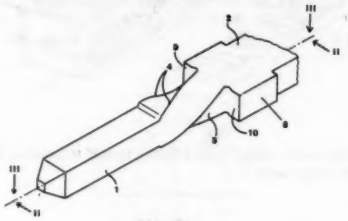
CONTACT INSERTABLE IN A METALLIZED HOLE OF A PRINTED CIRCUIT CARD AND PROCESS

Harry Zust, Weinbergstrasse 58, 8703 Erlenbach, and Sigi Burgi, Bohlstrasse 7, 6301 Zug, both of Switzerland

Continuation of Ser. No. 296,453, Aug. 26, 1981, abandoned. This application Jul. 18, 1984, Ser. No. 632,259

Int. Cl.⁴ H01R *4/24*

U.S. Cl. 339—17 C **14 Claims**



1. The combination of a printed circuit card (6) of a predetermined thickness having a hole (5) formed therein, said hole having a metallized contact surface layer (7) on its walls, with

an elongated contact terminal pin element insertable in the hole, for making electrical connection with the metallized contact surface layer (7) of the hole and for mechanical attachment to the printed circuit card (6),

wherein the terminal pin element comprises:

a first end portion (1) of polygonal cross-section and suitable for a wire-wrap connection dimensioned to pass through the hole (5) and project beyond one of the faces of the card (6) when the contact pin element is in an inserted position in the card;

a second end portion (2) of polygonal cross-section and suitable for a wire-wrap connection dimensioned to project beyond the other face of the card when the contact is in the inserted position;

an intermediate portion (3) of twisted polygonal cross-section and of a length corresponding about to the thickness of said card connecting the first and second end portions,

the surfaces of said intermediate portion having edges defining twisted corners;

said end portions and intermediate portion being substantially aligned on a common axis which is also the axis of twist of said intermediate portion,

whereby said terminal element is inserted by only axial pressure on said second end portion while permitting free rotation of the pin element to self-twist the pin element into the hole,

and wherein said intermediate portion, when inserted in said hole, engages by said twisted corners the metallized interior surface layer (7) of the hole and at the same time ensures mechanical retention of the terminal pin element in the hole, by deformation of said metallized contact surface layer in a spiral path which leaves said surface layer electrically continuous and forms a gas-tight connection preventing corrosion of the contact surface of said metallized layer which is in engagement with said pin element.

4,557,540

PROGRAMMED SOCKET AND CONTACT

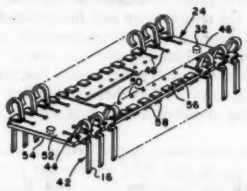
Mel L. Forbes, Chardon, and John T. Venaleck, Madison, both of Ohio, assignors to 4C Electronics, Inc., Mentor, Ohio

Filed Jan. 18, 1984, Ser. No. 571,737

Int. Cl.⁴ H01R *23/72*

U.S. Cl. 339—17 CF **7 Claims**

1. An electrical contact pair mechanically connected for use in manufacturing and mechanically disconnectable for use in the operation of a programmed socket having a printed circuit board and arrays of terminal pads on each side of the board connected by tracings, said contact pair comprising a lower contact with an axially extending pin portion and a lower planar base generally normal to the axis of said pin portion for making an electrical connection with one of the terminal pads on the lower side of the printed circuit board, an upper contact with an upper planar base parallel with said lower planar base for making an electrical conection with one of the terminal pads on the upper side of the printed circuit board an an arcu-



ate portion formed from a flat strip curved about an axis parallel to said planar bases, and connecting means for connecting said upper contact with said lower contact during manufacture of a programmed socket, said connecting means including a severable flat strip of material curved between the planar bases of said upper and lower contacts about an axis normal to the axis of said arcuate portion, said flat strip of material being severable after the contact bases have been electrically attached to respective terminal pads of the printed circuit board thereby leaving two mechanically separate contacts on opposite sides of the printed circuit board.

4,557,541

APPARATUS FOR CONNECTING CABLES TO PRINTED CIRCUIT BOARDS

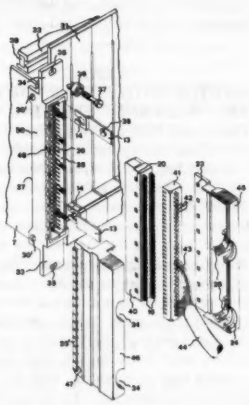
Gernot Steuernagel, Offenbach, and Willy Bohnenberger, Mainhausen, both of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 22, 1984, Ser. No. 623,431

Claims priority, application Fed. Rep. of Germany, Jun. 25, 1983, 3323029

Int. Cl.⁴ H01R *11/20, 23/68, 13/506*

U.S. Cl. 339—17 LM **5 Claims**



1. An apparatus for electrically connecting a cable including insulated wires to terminals on a first printed circuit board

which bears electronic devices and which is disposed in an equipment housing having front and rear sides, said first printed circuit board having a rear end directed toward the rear side and a front end directed toward the front side, with a plurality of second printed circuit boards being disposed in said housing parallel to said first printed circuit board, at least one second printed circuit board being affixed to a front plate for mounting said at least one second printed circuit board, comprising:

a first female multi-point connector attached to said first printed circuit board adjacent the rear end thereof, said female multi-point connector being electronically connected to the terminals on said first printed circuit board;

a rear wall panel extending transversely to said printed circuit board and closing the rear side of the equipment housing, said rear wall panel having first and second sides and having rows of holes therein, said first printed circuit board being disposed at the first side of said rear wall panel;

a male multi-point connector affixed to the first side of said rear wall panel, said male multi-point connector having pins which are insertable into said female multi-point connector and which extend through the holes past the second side of said rear wall panel;

a guide frame mounted on the second side of said rear wall panel and surrounding said pins;

multi-point connectors means for attachment to the cable, the multi-point connector means being insertable into the guide frame to electrically connect the cable to the first printed board terminals, said multi-point connector means including

a second female multi-point connector having conductive cutting elements to electrically connect the wires by piercing the insulation of the wires when the wires are clamped against the cutting elements,

a wire distribution element holding the wires against said cutting elements,

two housing half-shells surrounding the second female multi-point connector and the wire distribution element, and

detent means provided on said housing half-shells for holding said half-shells together;

an additional male multi-point connector fastened to said front end of said first printed circuit board and electrically connected to terminals on said first printed circuit board; and

an additional guide frame surrounding said additional male multi-point connector, said additional male multi-point connector having a length and width substantially matching the length and width of said front plate.

4,557,542

CONNECTOR WITH MEANS FOR RETAINING TERMINALS AND VERIFYING SEATING

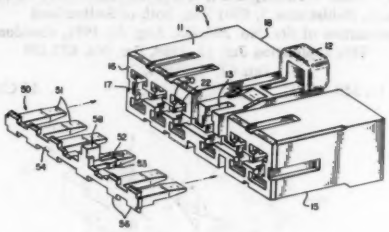
James R. Coller, and Paul A. Coon, both of Kernersville, N.C., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jun. 11, 1984, Ser. No. 618,984

Int. Cl.[4] H01R *11/00*

U.S. Cl. 339—59 M **4 Claims**

1. An electrical connector of the type comprising an insulative housing having a mating face and an opposed conductor receiving face, the mating face being defined by an endwall, two rows of terminal receiving cavities extending between said faces, each cavity receiving a terminal therein from said conductor receiving face, each cavity communicating with an open mouth in said endwall, said housing having two adjacent rows of resilient latch arms therein, each latch arm flanking a respective cavity and cooperating with a terminal therein to retain same therein when fully inserted, each arm having a distal end toward said mating face, each arm being separated from the adjacent arm by an interstice in the housing, each arm deflecting into the interstice during insertion of a terminal, and returning toward the respective cavity when the terminal is fully inserted, the improvement comprising, wedge means received in the mating face of said housing between said rows



of cavities, said wedge means fitting in said interstices between adjacent latch arms.

4,557,543

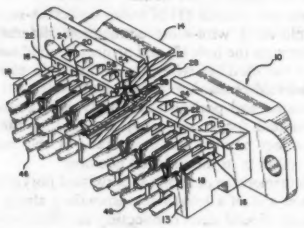
KEY HOLE RETENTION

Earl W. McCleerey, Mechanicsburg, and John A. Root, Harrisburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 163,915, Jun. 27, 1980, abandoned. This application Mar. 25, 1985, Ser. No. 715,705

Int. Cl.[4] H01R *13/432*

U.S. Cl. 339—97 P **4 Claims**



1. An improved pin and socket type connector comprising:

an insulative housing having a forward mating face, an opposed rear terminal receiving face, and two parallel rows of terminal receiving passages and two opposed outer surfaces extending therebetween, each passage having a forward portion adjacent the mating face, an open rear portion opening on the adjacent outer surface adjacent the terminal receiving face, and a retention portion therebetween, the retention portion of each passage having a key hole profiled entry portion toward the rear face, the entry portion comprising a slot extending radially toward the adjacent outer surface, the retention portion being intersected by an aperture extending from the adjacent outer surface into the passage adjacent the entry portion forming a forward facing shoulder on either side of the slot;

a plurality of stamped and formed terminals mounted in respective passages, each having a cylindrical mating portion received in the forward portion of a passage, an open insulation displacing conductor engaging rear portion received in the open rear portion of the passage, and a retention portion therebetween received in the retention portion of the passage, the retention portion of each terminal comprising a pair of adjacent symmetric flanges having first portions which are substantially coplanar with the axis of the cylindrical mating portion and extend radially beyond the cylindrical mating portion toward the adjacent outer surface, the flanges having respective second

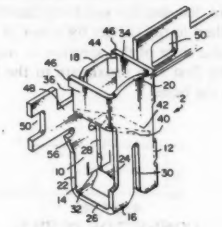
portions extending freely rearward from respective first portions and mutually diverging to free ends which abut respective shoulders.

4,557,544

TERMINAL FOR CONNECTING A LEAD WIRE TO A COIL WIRE

Wilhelm C. J. Esser, Tilburg, Netherlands, assignor to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 17, 1984, Ser. No. 682,469
Int. Cl.[4] H01R *4/24*
U.S. Cl. 339—97 R **8 Claims**



1. A strip of electrical terminals, each of the terminals being of the type comprising a pair of plate-like members in aligned spaced-apart relationship, each of the plate-like members having a first end, a second end, and side edges extending between the ends, the first ends being connected to each other by spaced-apart connecting straps, each of the members having a wire-receiving slot extending inwardly from its first end for reception of a first wire, a connecting member on the terminal for connecting a second wire to the terminal, the terminals being connected to each other in side-by-side relationship, the strip of terminals being characterized in that:

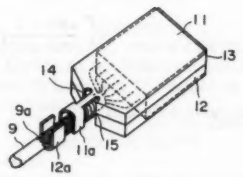
one of the plate-like members has a pair of stabilizing ears extending from its side edges towards the other plate-like member, the stabilizing ears having free ends which are located beyond the side edges of the other plate-like member whereby each of the plate-like members is stabilized against movement in its own plane relative to the other plate-like member.

4,557,545

SHIELDED ELECTRICAL CONNECTOR

Tomonari Ohtsuki, and Takao Hirose, both of Tochigi, Japan, assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Apr. 11, 1984, Ser. No. 598,932
Claims priority, application Japan, Apr. 25, 1983, 58-61666[U]
Int. Cl.[4] H01R *13/58, 13/658*
U.S. Cl. 339—103 M **18 Claims**



1. In a shielded electrical connector including at least one electrical contact supported by a supporting insulator, a shield cover for the connector and a cable clamp for engaging a cable adapted to be connected with the connector, the improvement comprising:

said shield cover being formed of separate top and bottom overlapping parts adapted to be compressed to each other so as to sandwich said insulator therebetween, and

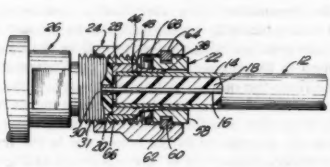
cable clamp means integrally formed with each of said top and bottom parts and adapted for engaging with said cable, after said top and bottom parts are overlapped on said insulator, and for electrically connecting said cable to said shield cover, whereby the requirement of clamping means, separate from the connector, to ensure secure mechanical and electrical connection between the connector and the cable is eliminated.

4,557,546

SOLDERLESS COAXIAL CONNECTOR

Charles W. Dreyer, Fairfield, Conn., assignor to Sealectro Corporation, Mamaroneck, N.Y.

Filed Aug. 18, 1983, Ser. No. 523,861
Int. Cl.[4] H01R *17/18*
U.S. Cl. 339—177 R **6 Claims**



1. An assembly for releasably joining one end of a semi-rigid coaxial cable to a coaxial connector, said coaxial connector including an array of threads, said assembly comprising:

an inner sleeve for mounting generally concentrically around the cable, said inner sleeve including generally cylindrical inner and outer surfaces and oppose clamping and connecting ends, the diameter of said cylindrical inner surface being substantially equal to the diameter of said cable, said cylindrical inner surface including an inwardly extending annular ledge adjacent the connecting end of said inner sleeve for limiting the axial movement of said inner sleeve relative to the cable, said inner cylindrical surface including a plurality of annular grooves extending from said clamping end to a point intermediate said clamping and connecting ends, said plurality of annular grooves defining clamping ridges therebetween, said inner sleeve further including a pair of angularly aligned slots extending from the clamping end thereof to a point intermediate the clamping and connecting ends, said inner sleeve being compressable into secure engagement with the cable adjacent said slots and said clamping ridges of said inner sleeve;

an outer sleeve for telescopingly sliding over the clamping end of the inner sleeve to progressively compress the inner sleeve;

coupling means for threadably engaging the coaxial connector and for limiting movement of the inner and outer sleeves along the cable; and

a locking ring mounted intermediate said outer sleeve and said coupling means, said locking ring enabling rotable movement between said outer sleeve and said coupling means but preventing relative axial movement between said outer sleeve and said coupling means.

4,557,547

CONNECTOR FOR ELECTRICAL SUPPLY SYSTEM

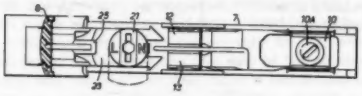
Robert A. Stuart, Newhaven, England, assignor to Rotaflex plc, London, England

Filed Jan. 10, 1983, Ser. No. 457,058

Claims priority, application United Kingdom, Jan. 18, 1982, 8201242

Int. Cl.⁴ H01R *13/64*

U.S. Cl. 339—184 R **9 Claims**



1. In a supply connector for an electrical distribution track having an elongate channel and a plurality of electrical conductors housed in the channel and extending longitudinally thereof, said track including a longitudinally extending polarizing abutment, the connector comprising a body, contacts retractably carried by said body for engagement with respective track conductors, contact operating means movably mounted on said body for shifting said contacts between a retracted position enabling insertion of said connector into said channel and an extended position in contact with said conductors, fixed terminals on said body for the connection of electrical supply leads, the terminals being electrically connected to the contacts, and polarizing means adapted to project from the body for cooperating with the track to allow the connector to be mounted in the channel in either of two orientations 180° offset one from the other, the improvement which comprises means for selectively adjusting the polarizing means relative to the body to project at either side thereof whereby to reverse said allowable orientation of the connector in the track, indicating means coupled to the polarizing means and arranged to denote the terminals to which the supply leads should be respectively connected for the polarity selected, whereby to ensure that the track conductors are connected to the correct phases of the power supply, said polarizing means and contact operating means being cooperatively arranged such that said means for adjusting said polarizing means can be adjusted only in said retracted position of said contacts.

4,557,548

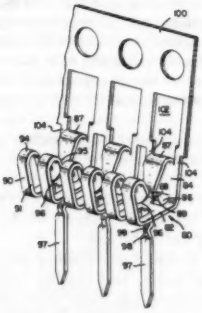
EDGE CONNECTOR FOR CHIP CARRIER

Roger L. Thrush, Clemmons, N.C., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 561,392, Dec. 14, 1983. This application Nov. 13, 1984, Ser. No. 670,857

Int. Cl.⁴ H01R *13/115*

U.S. Cl. 339—258 P **5 Claims**



1. A strip of stamped and formed electrical contacts of the type comprising a continuous carrier strip having said contacts attached laterally thereto in side-by-side relation, each contact comprising a contact section having a base and a pair of first and second opposed arms formed upward from the base, the arms being formed with respective mutually facing rolled contact surfaces, each contact further comprising a pin stamped out of the second arm leaving a close-ended slot therein, the pin being formed downward from the base, the strip being characterized in that

each arm of each contact extends from the base to a bend remote therefrom where it is formed through an obtuse angle toward the opposite arm of the pair thence to the contact surface, the first arm being stamped from the carrier strip leaving an aperture therein, each contact being attached to the carrier by a pair of straps extending from opposite sides of the aperture to respective opposite edges of the first arm proximate to the bend therein remote from the base.

4,557,549

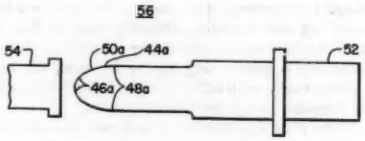
CONNECTOR DEVICE

Daniel E. Whitney, Arlington, Mass., assignor to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed Jun. 30, 1980, Ser. No. 164,837

Int. Cl.⁴ H01R *13/10*

U.S. Cl. 339—258 R **2 Claims**



1. A connector device including plug and socket components, one of the components being an elastic engagement element of length L and the other of said components including a chamfered surface, comprising:

a nose portion having a first positive slope of

$$\frac{\mu + X_1/L}{1 - \mu X_1/L};$$

a root portion having a second positive slope RZ_1/X_1, where R is determined by

$$\frac{\mu(\mu S + 1)}{(1 + \mu^2)}\left[\frac{RS - \mu}{\mu RS + 1} - \frac{X_1}{L}\right] = \ln\left[\frac{\mu RS + 1}{1 + \mu^2}(1 - \mu X_1/L)\right];$$

and

a convex fair curve defined as

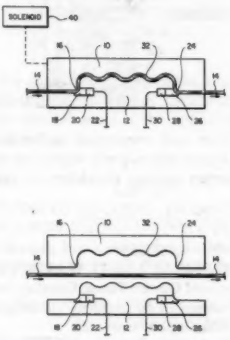
$$Z = -X/\mu + \frac{C(1 + \mu^2)}{K\mu^2(1 - C/KL)} \ln\left[\frac{\mu(X_1 - X) - C(1 - \mu X/L)/K}{\mu X_1 - C/K}\right]$$

interconnecting said nose and root portions.

4,557,550
OPTICAL FIBER TAPS

Penny L. Beals, Redwood City; Phyllis M. Simon, Fremont, and Bruce D. Campbell, Portola Valley, all of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Oct. 27, 1982, Ser. No. 437,054
Int. Cl.⁴ G02B 5/14
U.S. Cl. 350—96.15 **19 Claims**



1. A coupler for an optical fiber, the coupler having an open position in which it does not operate on the fiber and a closed position in which it does operate on the fiber, comprising:

first bending means through which the fiber passes and which has an open position in which the fiber is not bent and a closed position in which the fiber is bent sufficiently to cause at least a portion of an optical signal passing down the fiber to escape and be tapped from the fiber;

detecting means for detecting the tapped optical signal which has escaped from the fiber when it is maintained in a bent configuration by the first bending means;

signal attenuation means, located downstream of the first bending means, through which the fiber passes and which has an open position in which an untapped portion of the optical signal passing through the fiber is not attenuated and a closed position in which the untapped portion of the optical signal passing through the fiber is substantially attenuated to prevent confusion between the untapped portion of the optical signal and an optical signal to be injected;

second bending means, located downstream of the signal attenuation means, through which the fiber passes and which has an open position in which the fiber is not bent and a closed position in which the fiber is bent sufficiently to permit the injection of an optical signal into the fiber;

injecting means for injecting an optical signal into the bent position of the fiber when it is maintained in a bent configuration by the second bending means; and

bending and attenuation activating means for moving the first and second bending means and the attenuation means between their open and closed positions.

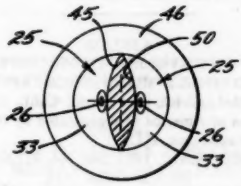
4,557,551
NON-LINEAR OPTICAL FIBER COUPLER AND A METHOD OF MAKING SAME

Richard B. Dyott, Orland Park, Ill., assignor to Andrew Corporation, Orland Park, Ill.

Filed Sep. 28, 1983, Ser. No. 536,621
Int. Cl.⁴ G02B 5/14
U.S. Cl. 350—96.15 **15 Claims**

1. A non-linear waveguide component comprising a pair of optical fibers having orthogonal polarization-holding axes, said fibers being disposed in side-by-side relation and defining between them a space of generally elliptically cross-section, the major and minor cross-sectional axes of said elliptical space having a predetermined geometric relationship to said polarization-holding axes of said fibers, and a single crystal of solid organic electro-optical material filling said space and having major and minor cross-sectional crystal axes coinciding with the major and minor cross-sectional axes, respectively, of said space.

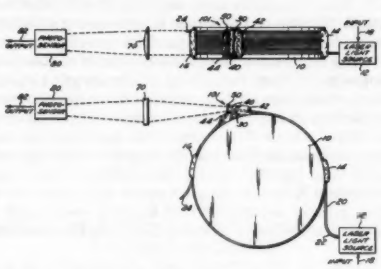
15. A method of making a non-linear waveguide component, said method comprising the steps of, providing a pair of optical fibers each having a generally elliptical core defining orthogonal polarization-holding axes, shaping one surface of each fiber so as to form such surface into a concave configuration, placing the fibers into an outer tube with the concave surfaces of the fibers disposed in spaced face-to-face relation and with the major axes of the cores of the two fibers extending parallel to one another, radially collapsing the tube to bring the fibers together while leaving a space of generally elliptical cross-section between the concave surfaces of the fibers, the major and minor cross-sectional axes of said elliptical space having a predetermined geometric relationship to said polarization-holding axes of said fibers, and growing a crystal of solid organic anisotropic electro-optic material in said space.



4,557,552
MICROBEND OPTICAL FIBER TAPPED DELAY LINE

Steven A. Newton, Menlo Park, and Cassius C. Cutler, Palo Alto, both of Calif., assignors to Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Filed Nov. 19, 1981, Ser. No. 323,037
Int. Cl.⁴ G02B 5/172
U.S. Cl. 350—96.15 **27 Claims**



1. A tapped optical fiber delay line, comprising:

a length of optical fiber positioned on a form having at least one raised portion, said fiber having first and second segments, each of said first segments passing over a raised portion on the form so as to create a bend of radius sufficiently small to cause a portion of a light signal traveling in said first segments to be directed out of said fiber at said first segments, and any bend radius in said second segments being sufficiently large to prohibit a portion of a light signal traveling in said second segments from being directed out of said fiber at said second segments; and

means for detecting light directed out of said fiber at said first segments.

21. A method of tapping an optical fiber delay line comprising the steps of:

providing a first form having a surface whose diameter is sufficiently large to prevent severe bending and associated loss of light from an optical fiber positioned thereon;

positioning a raised member on at least a portion of the surface of the first form;

wrapping a segment of an optical fiber around the form in a configuration such that at least a portion of said segment passes over the raised member so as to form a bend in the fiber of a radius sufficiently small to cause a portion of a light signal traveling in the fiber to be directed out of said fiber at the bend; and

positioning, adjacent the bend, a means of detecting the light emitted from the fiber at the bend.

4,557,553

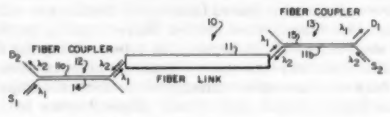
METHOD OF WAVELENGTH MULTIPLEXING IN FUSED SINGLE-MODE FIBER COUPLERS

Matthew N. McLandrich, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 2, 1981, Ser. No. 317,662

Int. Cl.⁴ G02B 5/14

U.S. Cl. 350—96.15 **2 Claims**



1. A method of entering and extracting a discrete wavelength of optical data transmitted in two wavelengths in a duplex optical data transmission system comprising:

transmitting the duplex optical data over a continuous single-mode fiber only, the step of transmitting includes the uninterrupted passing of the other wavelength throughout the continuous single-mode fiber and

evanescent field coupling one of two wavelengths of the duplex optical data to and from the system, the evanescent field coupling being effected by there being a one-hundred percent evanescent field coupling at the one wavelength and zero evanescent field coupling at the other wavelength, the step of evanescent field coupling includes the etching away of a precise layer thickness of the claddings of a like single-mode fiber and a portion of the continuous single-mode fiber, the joining of the length l of a like single-mode fiber to the portion of the continuous single-mode fiber to have a discrete center-to-center spacing of the fibers' cores and the fusing of the portion of the continuous single-mode fiber and the length l of the like single-mode fiber together so that the product of the coupling coefficient K and the length l equals $\pi/2$ at the one-hundred percent evanescent field coupled wavelength and equals π at the zero evanescent field coupled wavelength.

4,557,554

LIGHT PROJECTORS

Ernst Blanc, Oberderdingen/Gross Villars, Fed. Rep. of Germany, assignor to Richard Wolf GmbH, Fed. Rep. of Germany

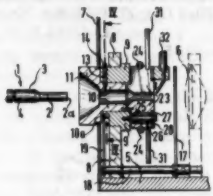
Filed Oct. 11, 1983, Ser. No. 540,797

Claims priority, application European Pat. Off., Oct. 12, 1982, 82109422.4

Int. Cl.⁴ G02B 7/26; F21V 29/00

U.S. Cl. 350—96.20 **16 Claims**

1. In a light projector of the kind comprising a condenser system and a shutter in front of a connector socket of a light conducting cable plug inserted into the same, the plug end of which plug at its proximal end adjacent the projector is reduced in diameter and is surrounded by a heat conductor, the improvement which consists in that the cable plug inserted into the connector socket installed in an annular mounting is enflanked at its diametrically reduced proximal end by a plurality of metal cooling jaws in the form of cylindrical annular segments in a radially inwardly spring-loaded manner and in contact therewith, which are thrustable against a spring system



at an axial spacing from said connector socket and its said annular mounting by means of a step of a thicker section of said plug coming into contact against shoulders of said cooling jaws.

4,557,555

SWITCH FOR OPTICAL LIGHT WAVEGUIDES

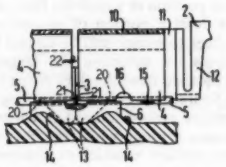
Peter Stoerk, Poecking, and Günter Thom, Gauting, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Feb. 1, 1983, Ser. No. 562,905

Claims priority, application Fed. Rep. of Germany, Feb. 5, 1982, 3203930

Int. Cl.⁴ G02B 5/14

U.S. Cl. 350—96.20 **11 Claims**



1. In a switch for coupling and uncoupling a first waveguide from a second waveguide, said switch having means including a fixed carrier part for holding an end of the first waveguide in a fixed position in a switch housing and movable means including a support part for moving an end of a second waveguide between a first position in said housing optically coupled to the first waveguide and a second position uncoupled from said first waveguide, said support part being flexibly connected to the switch housing, the improvement comprising said support part being connected to the switch housing by at least one first flexible web having only one bending axis, said bending axis extending parallel to a waveguide axis of the end of the second waveguide.

4,557,556

METHOD OF FABRICATING AN OPTICAL ATTENUATOR BY FUSION SPLICING OF OPTICAL FIBERS

George A. Decker, Jr., Highlands, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Oct. 28, 1983, Ser. No. 546,734

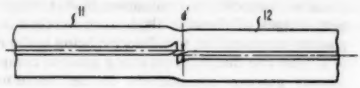
Int. Cl.⁴ G02B 5/14

U.S. Cl. 350—96.21 **7 Claims**

1. A method for fabricating an optical attenuator comprising the steps of:

offsetting the axes of the cores of a pair of optical fiber ends by an offset distance d in a range of twice the diameter of the core to one-half of the diameter of the cladding of the optical fibers;

moving one of the offset optical fiber ends along its center axis until they abut one another;
melting the abutted offset ends of the optical fibers into a splice;



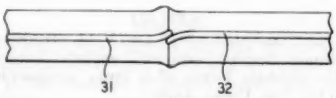
aligning the axes of the cores of the melted abutted ends of the optical fibers by way of surface tension; and
cooling the abutted ends of the optical fibers into a lumped optical attenuator.

4,557,557

METHOD OF MAKING AN OPTICAL FIBER ATTENUATOR USING A LOSSY FUSION SPLICE

Robert F. Gleason, Freehold, and John McLay, Holmdel, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Oct. 28, 1983, Ser. No. 546,735
Int. Cl.⁴ G02B 5/14
U.S. Cl. 350—96.21 **2 Claims**



1. A method for fabricating an optical attenuator comprising the steps of:
measuring the magnitude of distributed optical loss imposed on an optical signal transmitted through first and second abutted optical fibers;
aligning the abutted ends of the first and second optical fibers for minimum distributed optical signal loss through both optical fibers, as measured at the far end of the second optical fiber;
heating the abutted and aligned ends of the first and second optical fibers into a plastic state;
while the ends are in the plastic state moving one of the abutted ends axially for physically distorting the optical fiber ends until the measured optical signal loss increases by a desired additional lumped optical loss value; and
cooling the abutted ends of the first and second optical fibers to form a fusion splice imposing the desired additional lumped optical loss value between the ends of the first and second optical fibers and assuring a high level mechanical strength through the splice and along the fibers.

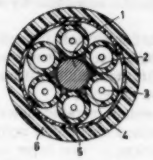
4,557,558

OPTICAL CABLE ELEMENT

Onno R. Bresser, Waddinxveen, Netherlands, assignor to N.K.F. Groep B.V, Rijswijk, Netherlands

Filed Dec. 23, 1982, Ser. No. 452,571
Claims priority, application Netherlands, Jan. 14, 1982, 8200126
Int. Cl.⁴ G02B 5/14
U.S. Cl. 350—96.23 **18 Claims**

1. An optical cable element comprising:
a core strength member;
an optical fiber wrapped around the core; and
a layer of a permanently elastic adhesive connecting the fiber to the core.
10. An optical cable element comprising:
a core strength member;
an optical fiber wrapped around the core;
a tubular sheath enclosing the optical fiber, said sheath having an outer surface; and



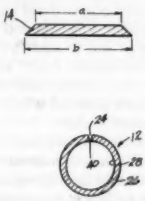
a layer of a permanently elastic adhesive connecting the outer surface of the sheath to the core.

4,557,559

PROCESS FOR DIE FORMING A TUBULAR MEMBER AT A REDUCED DRAWING FORCE

Joseph Winter, New Haven, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed Sep. 30, 1982, Ser. No. 430,069
Int. Cl.⁴ G02B 5/16
U.S. Cl. 350—96.23 **9 Claims**



1. A process for forming an optical fiber communication cable, said process comprising:
providing at least two metal or metal alloy strips;
forming at least one joint between said strips to form a continuous length of strip material;
shaping adjoining ones of said strips to bevel at least one longitudinal edge of each said strip, said shaping occurring only in an area adjacent said at least one joint;
pulling said continuous strip material through a die to form a tubular member, said shaping step reducing the drawing force exerted on said at least one joint as said joined strips pass through said die; and
inserting at least one optical fiber into said tubular member.

4,557,560

RODENT AND LIGHTNING PROTECTIVE SHEATH SYSTEM FOR CABLES

William D. Bohannon, Jr., Lawrenceville; Roy P. Collins, Norcross; Michael D. Kinard, Lawrenceville, and William C. L. Weinraub, Duluth, all of Ga., assignors to AT&T Technologies, Inc., Berkeley Heights and AT&T Bell Laboratories, Murray Hill, both of, N.J.

Filed Nov. 15, 1983, Ser. No. 551,797
Int. Cl.⁴ G02B 5/16
U.S. Cl. 350—96.23 **24 Claims**

17. A lightguide fiber cable, which is rodent and lightning resistant, said cable conprising:
a core which includes at least one lightguide fiber;
an inner sheath system which includes:
a tubular cover which encloses said core;
a plurality of strength members which are wrapped helically about said tubular cover; and
a jacket which covers said plurality of said strength members and which is made of a plastic material; and

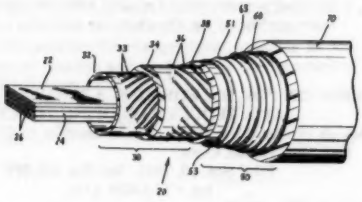
an outer sheath system which encloses said inner sheath system and which comprises:

a metallic inner shield which encloses said inner sheath system, which has a longitudinal seam and which has a relatively high thermal capacity and a relatively low resistivity;

a corrugated outer shield which encloses said inner shield and which has a longitudinal seam, said outer shield being a laminate which comprises:

a first adhesive material;

a corrosion-resistant metallic material which has at least a predetermined chromium content and a relatively high elongation, a base layer and an oxide surface layer to which is bonded said first adhesive material,



and a relatively coarse outer surface, said oxide layer having sufficient cohesion and sufficient adhesion to said base layer and to said first adhesive material to prevent delamination when said laminate is corrugated and formed about said inner shield; and

a second adhesive material which is bonded to said first adhesive material; and

a jacket which is made of a plastic material and which is bonded to said second adhesive material to form a composite with said corrosion-resistant metallic material which has sufficient thickness, elongation and tensile strength to cause said composite to inhibit degradation of said cable by rodents and to provide said cable with enhanced lightning impact resistance.

4,557,561

DOPED GLASS AND PROCESS FOR MAKING

Hartmut Schneider, and Egon Lebetzki, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 285,617, Jul. 21, 1981, abandoned. This application Mar. 18, 1983, Ser. No. 476,571

Claims priority, application Fed. Rep. of Germany, Aug. 18, 1980, 3031147

Int. Cl.[4] C03B *37/025*

U.S. Cl. 350—96.34 **13 Claims**

1. An improved method for making a solid phase rod from which glass fibers having a refractive index profile having a uniform paraboloid configuration for use as light waveguides in optical communicators technology are formable, said method comprising the sequential steps of:

(A) heating an alkali-free silica glass tube which has been initially interiorly cleaned by a gas stream comprised of oxygen and sulfur hexafluoride with a narrow oxyhydrogen gas burner while simultaneously first passing at a flow rate of from about 200 to 2000 centimeters per minute through said tube a first gaseous composition comprised of silicon tetrachloride, oxygen, and at least one fluorine containing gaseous compound, said heating being conducted by moving said burner along the exterior of said tube in the direction of flow through said tube of said gaseous composition at a moving rate of from about 5 to 25 centimeters per minute, the interrelationship between said heating, said moving, said first passing, and said first gaseous composition being such that in front of the zone of heating produced by said burner a precipitation of silica glass powder doped with fluorine occurs which powder is clear-melted onto the interior wall portions of said tube in such zone of heating,

(B) repeating step (A) at least twice,

(C) secondly, passing at a flow rate of from about 200 to 2000 centimeters per minute through said tube a second gaseous composition containing higher relative weight percentages of fluorine than were present in said first gaseous composition, said fluorine being in the initial form of at least one fluorine containing gaseous compound, said second gaseous composition further including silicon tetrachloride, oxygen, and at least one further chloride of elements selected of the group consisting of Ge, Al, Ti, Ta, Sn, Nb, Zr, Yb, La, P, B, and Sb,

(D) repeating said step (C) at least twice, each such repeat being conducted with a gaseous composition having a higher fluorine content,

(E) thirdly, passing at a flow rate of from about 200 to 2000 centimeters per minute through said, tube a final gaseous composition comprised of sulfur hexafluoride while said moving is continued at a moving rate of from about 2 to 45 centimeters per minute, the interrelationship between said heating, said moving, said third passing, and said final gaseous composition being such that a cleaning of said interior wall portions results,

(F) repeating said step (E) at least once,

(G) moving said burner along resulting tube at a temperature sufficient to melt said resulting tube into a solid rod.

2. A glass rod produced by the method of claim 1.

4,557,562

COPOLYMERS FOR OPTICAL FIBERS

Akira Ohmori, Ibaraki; Nobuyuki Tomihashi, Takatsuki, and Takahiro Kitahara, Settsu, all of Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

Continuation of Ser. No. 491,235, May 3, 1983, abandoned. This application Sep. 17, 1984, Ser. No. 651,648

Claims priority, application Japan, May 11, 1982, 57-79665

Int. Cl.[4] C08F *214/18;* **G02B** *5/172*

U.S. Cl. 350—96.34 **3 Claims**

1. In an optical fiber comprising a cladding and a core, the improvement wherein said cladding comprises a copolymer consisting essentially of

(a) fluoroalkylmethacrylate, said fluoroalkymethacrylate giving, when singly polymerized, a homopolymer having the properties of a glass transition temperature and a refractive index satisfying the following formulae (I) and (II), respectively.

$$1/T_g \leqq 9.47\times10^{-3}-4.556\times10^{-3}\times n^{20} \quad (I)$$

$$n^{20} \leqq 1.42 \quad (II)$$

wherein T_g represents the class transition temperature and n^{20} represents the refractive index of said hompolymer,

(b) 0.5 to 10% by weight of acrylic acid based on the weight of said fluoroalkylmethacrylate, and

(c) 0 to 30% by weight of a methacrylic acid ester based on the weight of said fluoroalkylmethacrylate.

4,557,563

TWO DIMENSIONAL ELECTRO-OPTIC MODULATOR FOR OPTICAL PROCESSING

Robert A. Sprague, Saratoga, Calif., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 309,650, Oct. 8, 1981, Pat. No. 4,480,899. This application Aug. 17, 1984, Ser. No. 641,803

Int. Cl.[4] G02F *1/03;* **G09F** *9/30*

U.S. Cl. 350—162.12 **3 Claims**

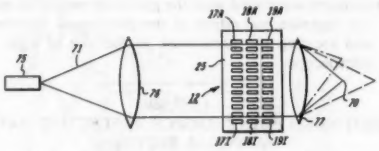
1. An electro-optic device for optical data processing, said device comprising

an electro-optic element having a reflective surface;

a two dimensional planar array of individually addressable

electrodes proximate the reflective surface of said electro-optic element;

means for applying a light beam to said electro-optic element at a near grazing angle of incidence with respect to said reflective surface for total internal reflection therefrom, said light beam illuminating said reflective surface over an area which is substantially coextensive with said array;



means for applying data to said electrodes, whereby fringe electric fields are coupled into said electro-optic element to spatially modulate said light beam essentially simultaneously in two dimensions in accordance with said data; and

a focusing lens optically aligned with said electro-optic element for bringing said modulated light beam to focus, thereby providing an optical Fourier transform of said data.

4,557,564

MOVABLE SCANNING UNIT FOR AN OPTICAL RECORDING OR PLAYBACK APPARATUS

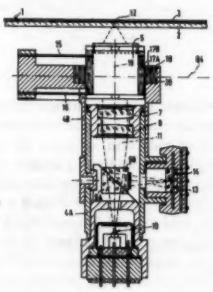
Gerard E. van Rosmalen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 13, 1984, Ser. No. 570,320

Claims priority, application Netherlands, Oct. 27, 1983, 8303700

Int. Cl.[4] G02B *7/04*

U.S. Cl. 350—247 **18 Claims**



1. An electro-optical device for scanning an information disc without mechanical contact, which device comprises:

a movable optical system comprising at least one optical element,

supporting means which movably support the optical system and which are long in relation to their thickness, and

an electromagnetic actuator comprising first actuator means and second actuator means which cooperate electromagnetically with each other via an air gap for moving the optical system in a controlled fashion, and a magnetic pretensioning device comprising first pretensioning means and second pretensioning means, which first and second pretensioning means cooperate magnetically with one another via an air gap and pretension said supporting means in the longitudinal direction.

4,557,565

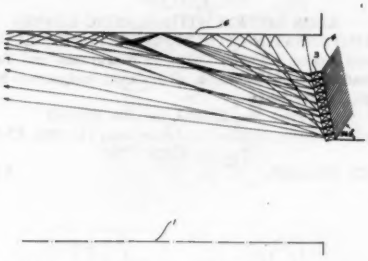
BEAM SUNLIGHTING DEVICE FOR BUILDING INTERIORS

Nancy C. Ruck; David R. Mills, and Erik Harting, all of Sydney, Australia, assignors to Unisearch Limited, Kensington, Australia

Continuation-in-part of Ser. No. 423,306, Sep. 24, 1982, abandoned. This application Apr. 3, 1984, Ser. No. 596,272

Int. Cl.[4] G02B *17/00, 27/00*

U.S. Cl. 350—262 **4 Claims**



1. A plane panel adapted to be mounted on a building facade so as to redirect incident sunlight toward the interior of said building by refraction and by substantially total internal reflection, said panel comprising a transparent plate having parallel equally spaced apart triangular ribs on one surface, the slope angle γ of one face of each triangular rib relative to a plane normal to the plane of the panel being such that $21° \leqq \gamma \leqq 33°$, the slope angle β of the other face of each triangular rib relative to said normal plane being such that $6° \leqq \beta \leqq 15°$ and wherein the include angle $(\beta+\gamma)$ is such that $36° \leqq \beta+\gamma \leqq 42°$, the orientation of the panel in use being such that said one face is the uppermost face of each triangular rib and wherein the surface of the plate opposite the grooved surface is planar.

4,557,566

SPHERICAL LENS FOR SPHERICALLY SYMMETRICAL GRADED REFRACTIVE INDEX DISTRIBUTION PROVIDED WITH ROD CLAD

Keisuke Kikuchi, Ibaraki; Takitaro Morikawa, Sayama; Junichi Shimada, Ibaraki, and Kenjiro Sakurai, Tokyo, all of Japan, assignors to Agency of Industrial Science & Technology and Ministry of International Trade & Industry, both of Tokyo, Japan

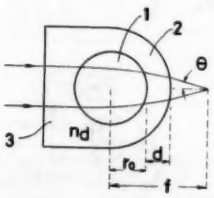
Filed Mar. 26, 1982, Ser. No. 362,500

Claims priority, application Japan, May 1, 1981, 56-66612

The portion of the term of this patent subsequent to Dec. 27, 2000, has been disclaimed.

Int. Cl.[4] G02B *5/14, 5/16, 9/02*

U.S. Cl. 350—413 **10 Claims**



1. A lens comprising a core having refractive index distribution graded sphere-symmetrically in proportion to the distance from the center thereof and provided on at least one part of the periphery thereof with a spherical surface capable of passing

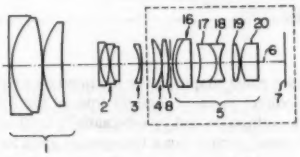
beams of light in and out, a clad of the shape of a spherical shell provided on the light inlet or outlet side of the spherical surface of said core, possessed of uniform refractive index and designed so as to minimize the spherical aberration relative to at least the coefficients of the second and fourth orders in the development of the polynominal representing the refractive index of the said core, and a rod clad provided on the remaining one of said light inlet and outlet sides of the spherical surface of said core and possessed of uniform refractive index.

4,557,567

LENS SYSTEM WITH PLASTIC LENSES COMPENSATING FOR TEMPERATURE CHANGES

Takashi Azumi, Katsuta; Takesuke Maruyama, and Takanori Hisada, both of Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 5, 1983, Ser. No. 455,803
Claims priority, application Japan, Jan. 11, 1982, 57-1727
Int. Cl.[4] G02B *7/04*
U.S. Cl. 350—427 **9 Claims**



1. A lens system constructed by a combination of a plurality of lenses comprising:

at least one plastic lens to be corrected the focal length of which is variable in accordance with ambient temperature changes; and

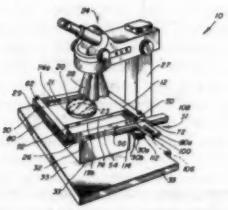
a compound lens consisting of a plastic lens and a glass lens opposed to each other, opposed surfaces of the plastic lens and the glass lens of said compound lens having substantially the same radius of curvature, the plastic lens and the glass lens of said compound lens being cooperative to function as an equivalent single lens, and the plastic lens of said compound lens having such power as to correct shifting of an image forming plane of the lens system caused by temperature change dependent changes of said at least one plastic lens to be corrected.

4,557,568

GUIDE RAIL APPARATUS FOR POSITIONING FLAT OBJECTS FOR MICROSCOPIC EXAMINATION

Peter J. Van Benschoten, Rancho Santa Fe, Calif., assignor to The Micromanipulator Microscope Company, Inc., Escondido, Calif.

Filed Jan. 23, 1984, Ser. No. 572,932
Int. Cl.[4] G02B *21/26*
U.S. Cl. 350—531 **7 Claims**



1. A photomask inspection station comprising

a microscope having an objective and a predetermined line of sight,

a stage positioned below the microscope objective,

said stage having a pair of spaced guide rail means each having surfaces for supporting a photomask and laterally positioning the photomask below the objective of the microscope,

means for adjusting the relative spacing of the guide rails, and

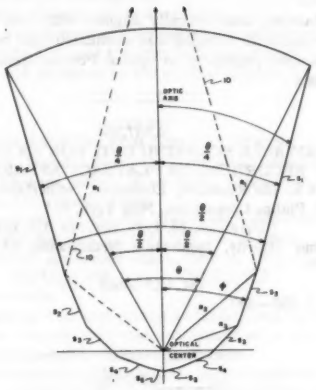
stop means associated with the guide rail means for positioning opposite end edges of the photomask therebetween and locating the photomask in the line of sight of the microscope.

4,557,569

DISTENDED POINT SOURCE REFLECTOR HAVING CONICAL SECTIONS

Michael Hacskaylo, Falls Church, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 17, 1983, Ser. No. 552,931
Int. Cl.[4] G02B *5/10*
U.S. Cl. 350—630 **6 Claims**



1. A radiation reflector having a surface for reflecting radiation in a right circular cone of predetermined vertex angle θ from a point source of radiation, wherein the surface consists of contiguous conical segments having shapes as though generated by rotation of a continuous curve template about an axis, and whereby the curve is generated within a circle of radius R_1 with its center on said axis, and consists of a series of joined line segments having lengths Si related to R_1 and θ, and at angles ϕi with respect to said axis also related to R_1 and θ, and wherein said point source is placed in said reflector at a position corresponding to the center of said circle.

4,557,570

CAMERA ASSEMBLY FOR THREE-DIMENSIONAL PHOTOGRAPHY

Stephen P. Hines, Glendale, Calif., assignor to Walt Disney Productions, Burbank, Calif.

Filed Sep. 26, 1983, Ser. No. 535,991
Int. Cl.[4] G03B *35/08, 21/18;* F16H *21/44;* F04C *2/54*
U.S. Cl. 354—113 **36 Claims**

1. A camera assembly for three-dimensional photography, comprising:

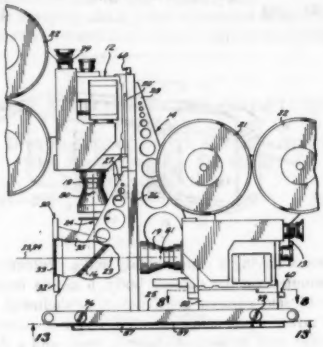
a frame;

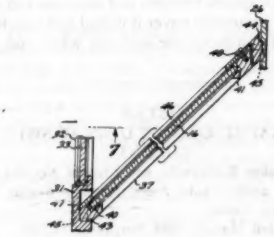
a beamsplitter on said frame for receiving light from a scene and for separating the received light into substantially equal reflected and transmitted portions;

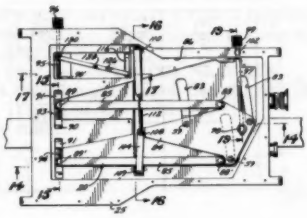
a first camera on said frame for receiving one of the reflected and transmitted light portions;

a second camera on said frame for receiving the other of the reflected and transmitted light portions; and

a mechanical control linkage movably supporting said second camera with respect to said frame, said control linkage including means for substantially independently displacing said second camera relative to said first camera to selectively adjust the interocular spacing between said first and second cameras and for displacing said second camera relative to said first camera to selectively adjust the angular relationship of the sight lines of said first and second cameras.







4,557,571

COMPACT CAMERA WITH FLASH UNIT

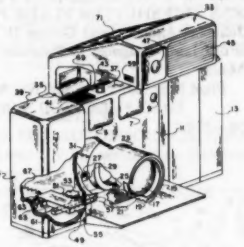
Michael Reibl, Sindelfingen, Fed. Rep. of Germany, assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 13, 1984, Ser. No. 650,134

Claims priority, application Fed. Rep. of Germany, Dec. 16, 1983, 8336141[U]

Int. Cl.⁴ G03B *15/03*

U.S. Cl. 354—149.11 **3 Claims**



1. In a photographic camera of the type provided with a flash unit movable with respect to a camera housing between (i) an inactive position in which said flash unit forms an integrated part of said housing to cover a taking lens and (ii) an operative position in which said flash unit is remote from said lens to permit picture-taking, the improvement comprising:

means defining an opening in a front face of said camera housing;

means supporting said lens for translation along an optical axis, through said opening, between a storage position retracted in said camera housing and a picture-taking position extended from said front face; and

means for translating said lens to its picture-taking and storage positions in response to movement of said flash unit to its operative and inactive positions, respectively.

4,557,572

CAMERA

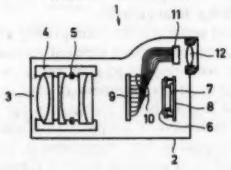
Willi Schickedanz, Langener Strasse 70, 6050 Offenbach am Main, Fed. Rep. of Germany

Continuation of Ser. No. 39,759, May 17, 1979, abandoned. This application Feb. 9, 1983, Ser. No. 465,255

Claims priority, application Fed. Rep. of Germany, Jun. 12, 1978, 2825764

Int. Cl.⁴ G03B *9/28, 13/02*

U.S. Cl. 354—219 **11 Claims**



4. A camera comprising:

a camera housing;

a picture-taking objective capable of reproducing objects to be photographed on a plane of a film;

at least one viewfinder for viewing the objects to be photographed;

at least one screen comprising a plurality of elements for separating an image into a plurality of image elements, said screen being at least temporarily located in a plane intermediate said objective and said film plane and in the

axis of the light beam of the objective so as to receive information transmitted from said objective towards said film plane; and

means for transmitting the information from said screen to said viewfinder to transmit thereto the picture seen by the objective.

4,557,573

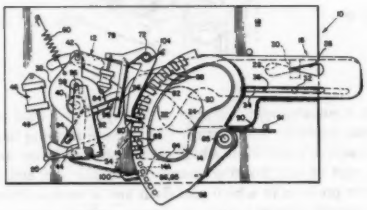
PHOTOSENSOR ARRANGEMENT FOR ENCODING LENS AND SHUTTER BLADE POSITION

Bruce K. Johnson, Andover, and George D. Whiteside, Lexington, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Mar. 28, 1984, Ser. No. 594,130

Int. Cl.⁴ G03B *3/10, 9/40*

U.S. Cl. 354—234.1 **2 Claims**



1. An exposure control system for an auto focus camera having means for defining a focal plane comprising:

an objective lens arrangement;

means for mounting at least part of said objective lens arrangement for displacement between a plurality of focal positions, said objective lens arrangement being adapted to focus an image of a subject located at a different distance from said camera within a given range of distances at the focal plane of said camera at each of its said focal positions, said mounting means also comprising a plurality of spaced apart position encoding apertures disposed for displacement in correspondence with said displaceable part of said objective lens arrangement;

a shutter blade mechanism;

means for mounting said blade mechanism for displacement between at least one arragnement wherein it blocks scene light from reaching the focal plane and another arrangement wherein it defines a maximum size aperture, said blade mechanism serving to define a range of progressively increasing sized apertures for admitting scene light to the camera focal plane as it moves from its said scene light blocking arrangement toward its maximum size aperture defining arrangement;

light emitting and sensing means comprising a light emitting diode and a photoresponsive element stationed in spaced apart relation with respect to each other on the opposite sides of the path of displacement of said encoding apertures and said shutter blade mechanism for providing an output signal indicative of the position of said displaceable part of said objective lens arrangement when the light emitted by said light emitting diode is transmitted to said photoresponsive element by way of said encoding slots and the position of said shutter blade mechanism at the instant that scene light is first transmitted to the focal plane when said shutter blade mechanism operates to block the transmission of light from said light emitting diode to said photoresponsive element upon its displacement therebetween; and

control means responsive to said output signal from said light emitting and sensing means for stopping the displacement of said objective lens arrangement at the appropriate focal position and for controlling another exposure influencing event.

4,557,574

CAMERA WITH PROTECTIVE COVER

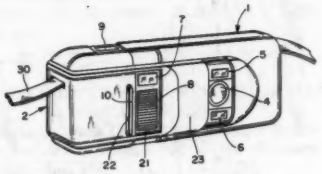
Atsuo Kohno, and Minoru Shiiba, both of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 1, 1984, Ser. No. 656,411

Claims priority, application Japan, Oct. 3, 1983, 58-152036; Oct. 3, 1983, 58-152037

Int. Cl.⁴ G03B *17/04*

U.S. Cl. 354—288 **14 Claims**



1. A camera having a camera body and a protective cover slidably mounted on the camera body, a taking lens on the front face of said camera body which is sheltered by said protective cover when said protective cover is closed and is exposed when said protective cover is open, and a flash unit disposed to one horizontal side of said taking lens on said front face of said camera body within the range of movement of said protective cover, there being an opening in said protective cover which is disposed between said flash unit and said taking lens when said protective cover is closed and which coincides with said flash unit to expose said unit when said protective cover is open.

4,557,575

PHOTOGRAPHING MODE DISPLAY SWITCHING CIRCUIT

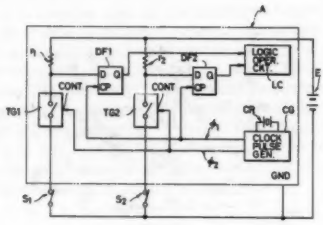
Eiichi Tano; Takeo Kobayashi, and Kiyoshi Negishi, all of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 9, 1984, Ser. No. 587,789

Claims priority, application Japan, Mar. 12, 1983, 58-34905[U]

Int. Cl.⁴ G03B *7/097*

U.S. Cl. 354—289.1 **3 Claims**



1. An electronic mode control circuit for a camera, comprising:

a plurality of mechanical switches, one of said mechanical switches being provided for each photographing mode of said camera, each of said mechanical switches having a first terminal coupled to a first terminal of a DC power source;

a plurality of resistors, one of said resistors being provided for each of said mechanical switches, each of said resistors having a first terminal coupled to a second terminal of said DC power source;

a plurality of analog switches, one of said analog switches

being provided for each of said mechanical switches, each of said analog switches having a first signal terminal coupled to a second terminal of a respective one of said switches and a second signal terminal coupled to a second terminal of a respective one of said resistors;

a plurality of flip-flops, one of said flip-flops being provided for each of said mechanical switches, each of said flip-flops having a signal input coupled to said second terminal of a respective one of said resistors; and

means for applying clock pulses to control terminals of said analog switches and to clock pulse inputs of said flip-flops.

4,557,576

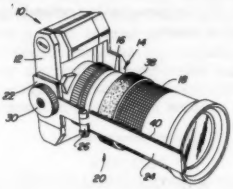
ANTI-CREEP ATTACHMENT FOR ZOOM LENS OF A CAMERA

Robert M. Drefchinski, P.O. Box 97, E. Moline, Ill. 61244

Filed Jun. 8, 1984, Ser. No. 618,807

Int. Cl.⁴ G03B *17/00*

U.S. Cl. 354—295 **10 Claims**



1. For use with a camera having a body element and a two-part zoom lens assembly including a body-affixed lens element and a movable lens part axially positionable along the body-affixed element: an anti-creep attachment for the camera for releasably retaining a selected position of axial adjustment of the movable lens part, comprising first engageable means affixed to the movable lens part, a base including means for the affixation thereof to one of the elements, a tongue extending from the base for disposition closely alongside the movable lens part and in close proximity to the first engageable means, second engageable means on the tongue and releasably cooperative with the first engageable means, and means mounting the tongue on the base for selective manual movement of the tongue radially toward and away from the movable lens part for respectively engaging and disengaging the first and second engageable means.

4,557,577

AUTO FOCUS APPARATUS FOR A CAMERA

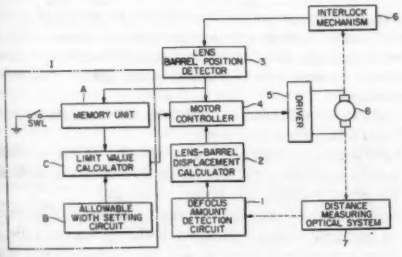
Nobuhiko Shinoda, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 15, 1983, Ser. No. 561,935

Claims priority, application Japan, Dec. 25, 1982, 57-234823

Int. Cl.⁴ G03B *3/10*

U.S. Cl. 354—400 **9 Claims**



1. An auto focus apparatus for a camera having a distance measuring circuit for detecting object distance and forming an object distance signal, and a control circuit for driving a photo-taking lens on the basis of said object distance signal and effecting a distance adjusting operation to vary the focus of the photo-taking lens, said apparatus including:

(a) a central distance value setting circuit for setting a central distance value representing the distance to an object for effecting an auto focus operation; and

(b) an allowing circuit which allows the distance adjusting operation of said control circuit to focus the photo-taking lens only within distances different by a predetermined amount from the distance represented by the central distance value set by said setting circuit.

4,557,578

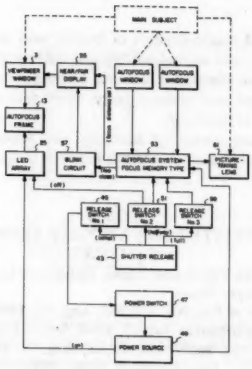
VIEWFINDER FOR AUTOFOCUS CAMERAS

Neil G. Seely, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 24, 1984, Ser. No. 685,866

Int. Cl.⁴ G03B *13/16*

U.S. Cl. 354—400 **5 Claims**



1. In an autofocus camera of the type wherein (a) a viewfinder is provided for composing a scene to be photographed and (b) an autofocus frame is provided in said viewfinder for framing the focus subject in the scene, the improvement comprising:

electrically activated means for highlighting said autofocus frame to prominently call attention to whether or not the focus subject is within the autofocus frame; and

manually operated means for activating said highlighting means before autofocusing can occur.

4,557,579

AUTOMATIC FOCUSSING APPARATUS

Yukio Nakajima, Kanagawa, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Dec. 8, 1983, Ser. No. 559,429

Claims priority, application Japan, Feb. 11, 1983, 58-20846; Feb. 28, 1983, 58-33655

Int. Cl.⁴ G03B *17/00, 3/10*

U.S. Cl. 354—402 **16 Claims**

1. An automatic focussing apparatus, comprising:

a first battery internally housed within a camera which is adapted to mate with a taking lens barrel;

a second battery internally housed within the lens barrel;

a camera operating member disposed on the camera;

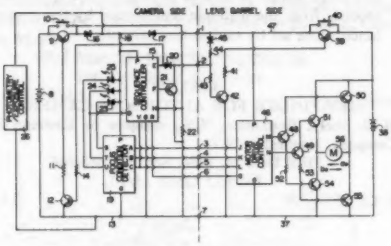
a lens operating member disposed on the lens barrel;

an in-focus detector circuit disposed within the camera for detecting an in-focus condition on an imaging surface and

for providing information which is utilized to drive a taking lens toward an in-focus position;

a motor drive circuit disposed within the lengs barrel and including a motor for moving the taking lens to an in-focus position in accordance with the information fed from the in-focus detector circuit;

first feed means for feeding the in-focus detector circuit from the first battery when the camera operating member is operated;



second feed means capable of feeding said motor drive circuit from said second battery and feeding said in-fo detector circuit through a contact dispose between said lens barrel and said camera body when said lens operating member is operated;

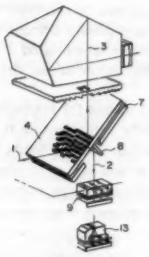
and actuating means for actuating said second feed means when said camera operating member is operated.

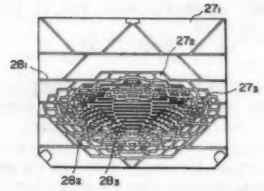
4,557,580

BEAM SPLITTER FOR A SINGLE LENS REFLEX CAMERA

Takashi Suzuki, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 407,765, Aug. 13, 1982, abandoned.
This application Jul. 23, 1984, Ser. No. 633,072
Claims priority, application Japan, Aug. 18, 1981, 56-129169
Int. Cl.[4] G03B *7/00, 19/12*
U.S. Cl. 354—406 **6 Claims**





1. A single lens reflex camera, comprising:

a photo-taking optical system for forming an image of an object to be photographed on an image plane;

a view finder optical system;

sensing means for sensing the sharpness of plural images of the object formed by said photo-taking optical system at different positions on the optical axis of said photo-taking optical system; and

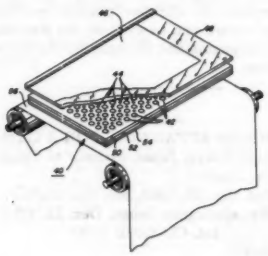
light splitting means, interposed between said photo-taking optical system and the image plane, for splitting the light from said photo-taking optical system into reflective light and transmissive light one of which is directed to said view finder optical system and the other of which is directed to said sensing means, said light splitting means having a light splitting surface with a reflecting portion and a transmitting portion, one of said reflecting and transmitting portions being dispersed within the other, wherein the ratio between said reflecting and transmitting portions is such that a greater part of the light from the central portion as compared to the light from the peripheral portion of said photo-taking optical system is directed to said sensing means.

4,557,581

FULL-FRAME SHORT FOCAL LENGTH IMAGING SYSTEM

Warren H. Woolley, Pittsford; William L. Lama, Webster; James D. Rees, Pittsford, and John A. Durbin, Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 3, 1984, Ser. No. 637,657
Int. Cl.[4] G03B *27/00*
U.S. Cl. 355—1 **11 Claims**



1. An imaging system for transmitting an image of a document at an object plane onto a photosensitive image plane, the system including a full-frame imaging and illumination device positioned between said object and image planes, said device comprising:

a plurality of short focal length lens elements assembled to form a full-frame lens array,

a light source positioned in at least some of the interstitial spaces separating said lens elements and on the surface of the array adjacent said object plane, and

means to activate said light source whereby light produced by said light source is directed to said document, reflected therefrom and projected by said lens array onto said image plane to form a latent image of said document on said image plane.

4,557,582
MAGNET ROLL

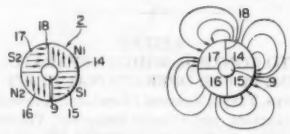
Fumitaka Kan, Tokyo, and Kimio Nakahata, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 21, 1983, Ser. No. 477,077

Claims priority, application Japan, Apr. 2, 1982, 57-55744; Apr. 6, 1982, 57-49596[U]; Apr. 6, 1982, 57-49597[U]

Int. Cl.⁴ G03G *15/08*

U.S. Cl. 355—3 DD **7 Claims**



1. A magnet roll comprising a magnet supporting shaft and a plurality of magnet pieces extending axially of said shaft and adhesively secured to one another and to the periphery of said magnet supporting shaft, at least one set of magnet pieces of said plurality of magnet pieces having magnetic anisotropy and the directions of the readily magnetizable axes of said set of magnetic pieces adjacent each other, respectively, being substantially orthogonal to an interface between said set of magnetic pieces.

4,557,583
APPARATUS FOR TRANSFERRING A TONER IMAGE FROM A PHOTOCONDUCTIVE COATING TO A PRINT SHEET

Milan Percic, VN Boxmeer; Hubertus J. Schoonderbeek, KK Beuningen, both of Netherlands, and Julia M. Alston, Myrtlebank, Australia, assignors to Coulter Stork Patents B.V., Amsterdam, Netherlands

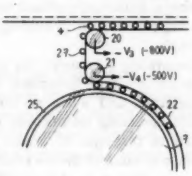
PCT No. PCT/EP82/00266, § 371 Date Aug. 11, 1983, § 102(e) Date Aug. 11, 1983

PCT Filed Dec. 14, 1982, Ser. No. 527,653

Claims priority, application Netherlands, Dec. 16, 1981, 8105676

Int. Cl.⁴ G03G *15/16*

U.S. Cl. 355—3 TR **13 Claims**



1. Apparatus for transferring a toner image formed on a photoconductive coating to a print sheet from an intermediate transfer sheet comprising, a top guide roller for pressing a transfer sheet over the surface of said coating and thereafter peeling said sheet off from said coating, said top guide roller being maintained during said pressing movement at a potential having a polarity the same as that of the toner charge and being maintained during the peeling off movement at a potential having a polarity opposite to that of the toner charge so as to permit transfer of the toner image to the transfer sheet, means for effecting subsequent transfer of said toner image from the transfer sheet to the print sheet, a frame and acceptor drum mounted in said frame and movable along the surface of the photoconductive coating from an initial position near one end thereof to the other end of said coating and return, means on said drum for holding the print sheet and the transfer sheet wound around the drum, a bottom guide roller coupled for movement with the drum, said top and bottom guide rollers being arranged parallel with the drum a small distance from each other to be brought independently of each other to a potential of selected polarity, the top roller being located farthest away from the drum and being effective for transferring toner from the photoconductive coating to the transfer sheet, said bottom roller being effective for transferring toner from the transfer sheet to the print sheet which is wound around the drum, the direction of winding being such that during winding of the transfer sheet on the drum the side of the transfer sheet carrying the toner image faces against the surface of the print sheet to which the final toner image is to be transferred.

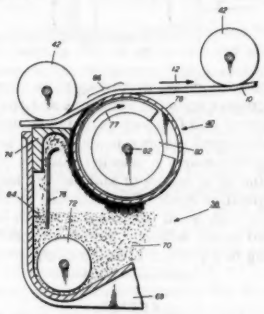
4,557,584
DEVELOPMENT APPARATUS IN WHICH THE ESCAPE OF PARTICLES IS MINIMIZED

Thomas L. Donnelly, Webster, and Orest Pavlovych, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed May 25, 1983, Ser. No. 497,947

Int. Cl.⁴ G03G *15/08*

U.S. Cl. 355—3 DD **8 Claims**



1. An apparatus for developing a latent image, including:

means for storing a supply of marking particles;

means for transporting marking particles from said storing means into contact with the latent image so as to develop the latent image;

a blade member positioned closely adjacent to said transporting means with the free end portion of said blade defining a gap therebetween so that said blade member removes extraneous marking particles from said transporting means with the marking particles removed from said transporting means moving along the underside of said blade member; and

a chute having one open end thereof positioned to receive the marking particles moving along the underside of said blade member and the other end thereof arranged to discharge the marking particles onto the marking particles in said storing means, said chute being spaced from said transporting means and, in conjunction with said blade member, confining the marking particles to prevent the escape of a cloud of particles from the apparatus.

4,557,585
RETURN SPEED CONTROL SYSTEM FOR USE IN A DOCUMENT SCANNING APPARATUS

Yasuo Abuyama, Ebina, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 3, 1984, Ser. No. 627,624

Claims priority, application Japan, Jul. 12, 1983, 58-126680

Int. Cl.⁴ G03G *15/00, 15/28*

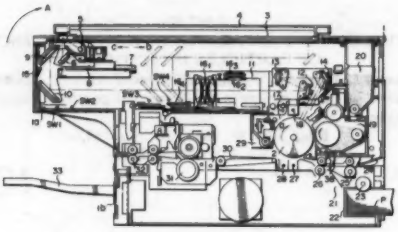
U.S. Cl. 355—8 **11 Claims**

1. A return speed control system for use in a document scanning apparatus with a moving means moving relative to a document for optical scanning, comprising:

first detecting means for detecting the arrival of said moving means at a first position as an initializing position when said moving means is in a backward motion;

second detecting means for detecting the arrival of said moving means at a second position separated by a predetermined distance from said first position in the scanning direction when said moving means is in a backward motion; and

control means for selectively setting up a high speed backward mode, a low speed backward mode, or a stop mode



in said moving means according to an operating state of said document scanning apparatus and the results of the detections of said first and second detecting means; and

said predetermined distance to define said second position being approximately a coasting distance of said moving means due to an inertia of said moving means generated when operation mode of said moving means is switched from said high-speed backward mode to said low-speed backward mode, whereby the return speed is optimized according to a position of said moving means.

4,557,586

IMAGE-FORMING APPARATUS

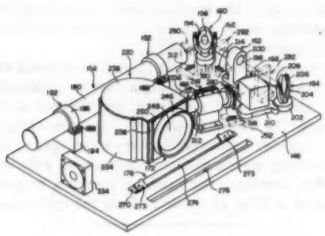
Kiyoshi Hayashi, Takatsuki; Setsuo Hori; Nobuyuki Hirata, both of Sakai; Kazuhiro Kobayashi, and Masayuki Mizuno, both of Osaka, all of Japan, assignors to Mita Industrial Co., Ltd., Japan

Filed Nov. 29, 1983, Ser. No. 556,213

Claims priority, application Japan, Nov. 30, 1982, 57-210288; Nov. 30, 1982, 57-181696

Int. Cl.⁴ G03G *15/00*

U.S. Cl. 355—11 **8 Claims**



1. An optical adjusting method in an image-forming apparatus comprising an optical means for projecting a scanned light beam to be controlled according to an image to be formed, an electrostatic image-forming means for receiving the scanned light beam projected from the optical means and forming an image corresponding to the scanned light beam, and a control means for controlling the optical means and the image-forming means, said optical means including a light beam generating means, a modulating means to which image signals corresponding to the image to be formed are fed from the control means and which modulates a light beam received from the light beam generating means according to the image signals, and a scanning means for scanning the light beam received from the modulating means; which comprises positioning an adjusting jig having at least two beam holes formed at predetermined positions between the modulating means and the scanning means, and adjusting the position of the modulating means such that the modulated primary beam from the modulating means passes through one of the beam holes and the non-modulated beam from the modulating means passes through the other beam hole.

4,557,587

RELATED TO CONTROL WHILE APPARATUS IS IN AN IMPROPER OPERATIONAL STATE

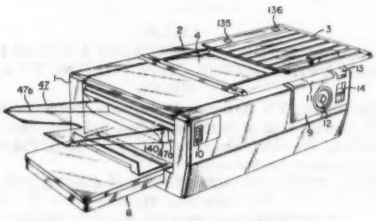
Yutaka Komiya, Tokyo; Katsumi Murakami, Kawasaki; Tsuneki Inuzuka, Machida, and Hisashi Sakamaki, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 156,645, Jun. 5, 1980, which is a continuation of Ser. No. 910,831, May 30, 1978, abandoned. This application Sep. 28, 1982, Ser. No. 425,706

Claims priority, application Japan, May 31, 1977, 52-64528; May 31, 1977, 52-64529; May 31, 1977, 52-64530

Int. Cl.⁴ G03G *15/00*

U.S. Cl. 355—14 C **26 Claims**



1. An image forming apparatus comprising:

means for forming an image on a recording material;

means for feeding said recording material from a storage supply thereof to an image forming area;

means for detecting a deficiency of said recording material in said storage supply and for providing an output signal indicative thereof;

control means comprising a memory for storing a program allowing execution of image formation when no material deficiency is detected and when no output signal is received from said detecting means, and for disabling said image formation in response to a said detecting means output, wherein said control means controls operation of said apparatus according to said program and in response to said detecting means;

input means for entering a specific instruction signal into said control means; and

means for enabling operation of said apparatus despite an occurrence of said deficiency in accordance with entry of said specific instruction signal.

4,557,588

IMAGE FORMING APPARATUS HAVING A CLEANING MEMBER

Masahiro Tomosada, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 13, 1983, Ser. No. 494,524

Claims priority, application Japan, May 21, 1982, 57-86326; May 25, 1982, 57-88704; May 26, 1982, 57-89228; May 26, 1982, 57-89229

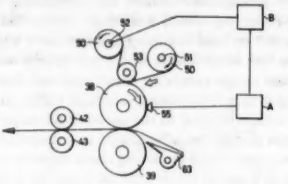
Int. Cl.⁴ G03G *21/00*

U.S. Cl. 355—14 R **23 Claims**

1. In an image forming apparatus for image formation on a recording sheet corresponding to input information, the com-

bination wherein the image may be formed on various sizes of recording sheets comprising:

a cleaning member for eliminating substances deposited on a surface of a member to be cleaned:



means for driving said cleaning member while in contact with the member to be cleaned; and

means for variably controlling the displacement of said cleaning member in response to the size of the recording sheet in use.

4,557,589

SORTING APPARATUS

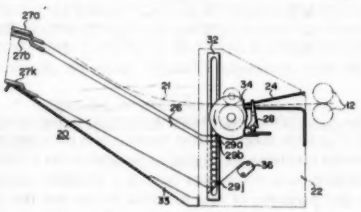
Yukihiro Fukushi, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Oct. 31, 1983, Ser. No. 547,356

Claims priority, application Japan, Nov. 5, 1982, 57-193446; May 26, 1983, 58-92661

Int. Cl.⁴ G03G *15/00*

U.S. Cl. 355—14 SH **9 Claims**



1. A sorting apparatus comprising:

a plurality of means for holding copies which are successively fed from an image forming device to a copy receiving section of the sorting apparatus, said sorting apparatus being operable electronically independent from said image forming device;

means for individually transferring said plurality of copy holding means to said copy receiving section in a predetermined direction so as to receive said copies successively fed from said image forming device;

means for detecting said copies which are successively fed from the image forming device to produce detection signals;

means for counting a first delivery timer interval between a rear end of one copy and a front end of a succeeding copy in response to said detection signals;

means for storing said first delivery time interval after being additionally summed with a first predetermined basic value, as a second delivery basic time thereby refreshing said second delivery basic time; and

means for comparing said first delivery time interval with said second delivery basic time and for controllably stopping transfer of said plurality of copy holding means in response to an original exchange when said first delivery time interval exceeds said second delivery basic time during the comparison operation.

4,557,590

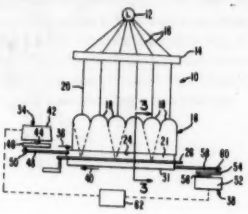
METHOD AND APPARATUS FOR MAKING TRUE THREE-DIMENSIONAL PHOTOGRAPHS FROM PSEUDO THREE-DIMENSIONAL PHOTOGRAPHS

Douglas F. Winnek, 80 Laurel Dr., Carmel Valley, Calif. 93924

Filed Sep. 10, 1982, Ser. No. 416,777

Int. Cl.⁴ G03B *27/32, 35/14*

U.S. Cl. 355—22 **12 Claims**



1. Apparatus for transferring a reversed image from a pseudoscopic image bearing film to an unexposed photographic film as a true stereoscopic image comprising: a lenticular member having a pair of opposed surfaces, one of the surfaces having a plurality of lenticulations thereon; a grating mask near the other surface of the lenticular member, said grating mask having a plurality of uniformly spaced slits transparent to light, the remainder of the mask being opaque to light; means on one side of the grating mask for shiftably mounting a first photographic film for movement relative to the mask in the space between the lenticular member and the grating mask, said first film having an image thereon to be transferred and to be reversed; means adjacent to the opposite side of the mask for shiftably mounting a second photographic film for movement relative to the mask; and second means coupled with the mounting means for the second film for moving the second film in a direction opposite to said one direction, whereby light from a source passing through the lenticular member and the first film will expose the emulsion of the second film and provide an image on the second film which is a reversal of the image on the first film.

4,557,591

PHOTOGRAPHIC PRINTING APPARATUS

Moriyoshi Serizawa, Hachioji, and Haruo Hakamada, Tachikawa, both of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

PCT No. PCT/JP82/00226, § 371 Date Feb. 8, 1983, § 102(e) Date Feb. 8, 1983, PCT Pub. No. WO82/04485, PCT Pub. Date Dec. 23, 1982

PCT Filed Jun. 11, 1982, Ser. No. 467,482

Claims priority, application Japan, Jun. 11, 1981, 56-90333

Int. Cl.⁴ G03B *27/52*

U.S. Cl. 355—40 **7 Claims**

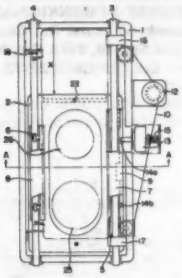
1. In a photographic printing apparatus wherein full size and half size pictures on a negative film are introduced into a printing position and printed on substantially full size photographic papers, the improvement comprising

a first image rotating lens for said full size pictures, said first lens having a first prism with a first reflecting surface,

a second image rotating lens for said half size pictures, said second lens having a second prism with a second reflecting surface, and

means for selectively positioning said first and second image rotating lenses into said printing position such that, when set in said printing position, said second image rotating lens is set so that it is displaced 45° around its central axis

relative to said first image rotating lens when said first lens is in said printing position, whereby half size printed images are rotated 90° relative to said full size printed images.

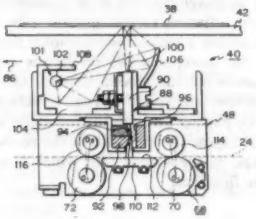


4,557,592

EXPOSURE-SCANNING APPARATUS

Yasuyuki Yokoyama, Hachioji; Takayoshi Hatano, Koganei; Kenji Suzuki, Tachikawa, and Koichiro Fujioka, Yokohama, all of Japan, assignors to Iwatsu Electric Co., Ltd., Tokyo, Japan

Filed Feb. 27, 1984, Ser. No. 584,096
Claims priority, application Japan, Mar. 8, 1983, 58-036594
Int. Cl.⁴ G03B *27/48*
U.S. Cl. 355—51 **17 Claims**



1. An exposure-scanning apparatus for focusing an erect, equal-sized light image of an original document on a image-receiving sheet, comprising:

a transparent platen maintained stationary to support said original document;

means for illuminating said original document supported on said platen;

a scanning box reciprocatively movable in parallel to said platen between a predetermined first position and a predetermined second position;

means for advancing said scanning box from said first position toward said second position at a predetermined constant speed and then returning the same toward said first position;

a sheet-transport means for supporting said image-receiving sheet and advancing the same in a direction the same as that of the advance of said scanning box at a speed twice that of the advance of said scanning box;

an optical-exposure means for receiving light rays transmitted from said original document and focusing an erect, equal-sized light image of said original document on said image-receiving sheet supported on said sheet-transport means during advance of said image-receiving sheet, said optical exposure means being arranged to move together with said scanning box at the same speed; and

a pair of spaced push rollers for pushing said image-receiving sheet onto said sheet-transport means at positions immediately before and after said light image formed on said image-receiving sheet in a direction of advance of said sheet, said push rollers supported on said scanning box to rotate freely, wherein said sheet-transport means includes:

a pair of spaced feed rollers for supporting thereon said image-receiving sheet, said feed rollers being rotatably supported on said scanning box to move together therewith at the same speed, said push rollers being urged to push said image-receiving sheet onto said feed rollers; and

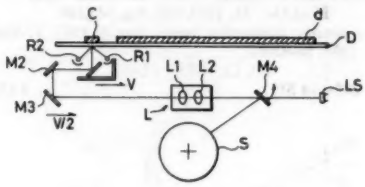
a rotating means for rotating said feed rollers at a peripheral speed which is equal to the speed of advance of said scanning box during the advance of said scanning box so as to advance said image-receiving sheet supported on said feed rollers at a speed twice that of advance of said scanning box.

4,557,593

FOCUS AND MAGNIFICATION DETERMINING AND CONTROL DEVICE FOR VARIABLE MAGNIFICATION TYPE COPYING MACHINE

Hisao Iwanade, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 17, 1984, Ser. No. 641,670
Claims priority, application Japan, Aug. 24, 1983, 58-154414
Int. Cl.⁴ G03B *27/34*
U.S. Cl. 355—57 **16 Claims**



1. In a variable magnification type copying machine in which a variable magnification zoom lens is disposed between a platen for receiving an original to be copied and a photosensitive surface, said zoom lens having a plurality of movable lenses, the positions of said movable lenses and the distance between said movable lenses being changeable to provide various copying magnifications, a focus and magnification determining and control device, comprising:

a focus and magnification determining chart located on said platen;

a sensor positioned to receive an image of said chart, said sensor generating determination signals indicative of the focus and magnification of said zoom lens;

means for producing an image of said chart on said sensor; and

means responsive to said determination signals for adjusting the positions of said movable lenses relative to the platen and photosensitive surface and for adjusting the distance between movable lenses.

4,557,594

MAGNIFICATION VARYING DEVICE FOR COPYING MACHINE

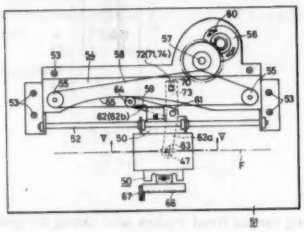
Ikuo Negoro, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 21, 1984, Ser. No. 642,904
Claims priority, application Japan, Sep. 8, 1983, 58-165757
Int. Cl.⁴ G03B *27/36, 27/38*
U.S. Cl. 355—58 **9 Claims**

1. In a magnification varying device for a copying machine in which a variable magnification zoom lens is arranged between an original surface and a photosensitive surface and a

copying magnification is varied by moving the movable lens groups in said zoom lens, the improvement wherein:

one of said movable lens groups of said zoom lens is fixedly secured to a slide plate which is movably supported on a base plate, and the other movable lens group is supported on said slide plate in such a manner as to be moved in association with swinging movement of a cam lever having a cam follower at a free end thereof, and



a cam plate fixedly secured to said base plate has a cam surface extending in a direction of movement of said slide plate so that said cam follower of said cam lever is held in contact with said cam surface, wherein,

as said slide plate is moved, the distance between said movable lens groups is varied continuously with the aid of said cam surface and cam lever according to a selected magnification.

4,557,595

OPTICAL APPARATUS FOR EXPOSURE AND/OR IMAGE REPRODUCTION OF MICROFICHE SHEET FILM, AND CASSETTE SUITABLE THEREFOR

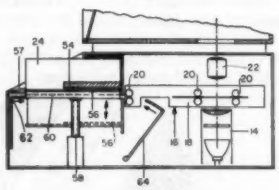
Klaus Freundt, Amselweg 15, 6472 Altenstadt, Fed. Rep. of Germany

Filed Jul. 1, 1983, Ser. No. 510,316

Claims priority, application Fed. Rep. of Germany, Jul. 3, 1982, 3224898

Int. Cl.⁴ G03B *27/58*

U.S. Cl. 355—72 **20 Claims**



1. An optical apparatus for the exposure and/or image reproduction of microfiche film sheets, comprising:

a cassette including (a) an inner part containing a plurality of the parallel microfiche film sheets in preselected respective separating guides, said inner part including a removal opening located along an adjacent set of side edges of the film sheets and an engagement opening located along another adjacent set of side edges of the film sheets, and (b) a cover part which covers said removal opening and said engagement opening of said inner part, said cover part and said inner part being movable relative to one another in a directon perpendicular to the planes of the film sheets;

a holding arrangement in which said cassette is received, said holding arrangement holding said cover part stationary and including a holding guide in which said inner part is movable at right angles to the planes of the film sheets away from said cover part;

an optical arrangement;

a transporting arrangement for transporting a selected microfiche film sheet along a predetermined transport plane extending from said holding guide to said optical arrangement; and

an opening and positioning mechanism for moving said inner part in said holding guide relative to said stationary cover part to uncover said removal opening and said engagement opening adjacent the selected film sheet and at the same time to position the selected film sheet in the transport plane of said transporting arrangement.

4,557,596

METHOD OF SCREENING HALF-TONE PICTURE THEMES

Hans Müller, Munich, and Stefan May, Herbertshausen, both of Fed. Rep. of Germany, assignors to GAO Gesellschaft fur Automation und Organisation mbH, Munich, Fed. Rep. of Germany

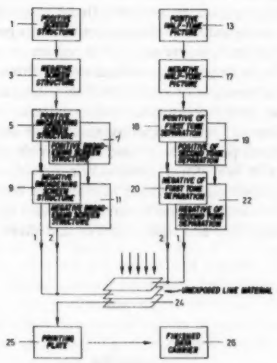
PCT No. PCT/DE82/00158, § 371 Date Mar. 30, 1983, § 102(e) Date Mar. 30, 1983, PCT Pub. No. WO83/00570, PCT Pub. Date Feb. 17, 1983

PCT Filed Jul. 29, 1982, Ser. No. 482,333

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1981, 3130182; Jul. 30, 1981, 3130183

Int. Cl.⁴ G03B *27/02*; G09F *3/02*

U.S. Cl. 355—132 **23 Claims**



1. A method of screening half-tone picture themes, the various half-tones or gray tones of the picture theme being reproduced by greater or smaller changes in the structural width of a basic screen structure, characterized in that

(a) a freely selectable change, which is characteristic for the relevant gray tone, in the structural width of a basic screen structure having any desired form is assigned to each or only some of the gray tones of the half-tone picture theme,

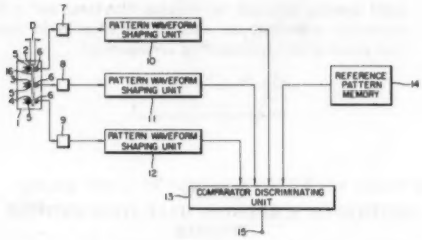
(b) for each gray tone selected under (a), the parts of the half-tone picture theme showing this gray tone are translated into the change in the structural width. of the basic screen structure assigned to this gray tone, by overlaying the relevant parts of the half-tone picture theme singly or collectively on the changed structural widths of the basic screen structure, which may also be present singly or collectively.

4,557,597

METHOD OF DISCRIMINATING BETWEEN THE FRONT AND BACK SIDES OF PAPER SHEETS

Takasuke Iwama, Kunitachi, Japan, assignor to Musashi Engineering Kabushiki Kaisha, Tokyo, Japan

Filed May 20, 1983, Ser. No. 496,382
Claims priority, application Japan, May 31, 1982, 57-91144
Int. Cl.⁴ G06K *9/74*
U.S. Cl. 356—71 **1 Claim**



1. A method for discriminating between the front and reverse sides, the upper and lower edges, and the left and right edges of a paper sheet having respectively different printed design patterns on its side front and reverse sides, the respective design patterns also being unsymmetrical as they extend between said upper and lower edges and between said left and right edges, said method comprising the steps of moving said sheet past three separate light transmitting and receiving sensors to substantially concurrently generate three respective electric output signals from said sensors; supplying said three electric signals respectively to three electronic waveform pattern shaping units to generate three respective waveform patterns representative of the respective sheet patterns moving past said sensors; generating twelve reference waveform patterns which, in respective combinations of three, are representative of four possible orientations of said sheet as it moves past said sensors, and storing said twelve patterns in a waveform pattern memory; and comparing said three sheet-representative waveform patterns with said twelve reference waveform patterns in a waveform comparator-discriminating unit to generate output signals which identify the respective facing directions of said front and reverse sides, said upper and lower edges, and said left and right edges of said sheet during its said movement.

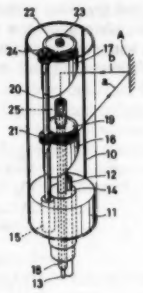
4,557,598

APPARATUS FOR CHECKING THE INTERNAL SURFACE OF A PIPE OR THE LIKE

Kimizo Ono, and Koichi Tsuno, both of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Dec. 9, 1982, Ser. No. 448,341
Claims priority, application Japan, Jan. 7, 1982, 57-1040[U]
Int. Cl.⁴ G01N *21/88;* G02B *23/02*
U.S. Cl. 356—241 **7 Claims**

1. An apparatus for checking the internal surface of a pipe or the like comprising a cylindrical casing having a circumferentially continuous light transmitting area, a light source fixed within said casing and emitting in a generally axial direction, a first reflex mirror rotatably mounted within said casing about an axis parallel to said casing to reflect the light from said source of light generally radially through said light transmitting area toward the object to be checked, a second reflex mirror rotatably mounted within said casing about an axis parallel to said casing and positioned to reflect the light from the object generally axially in said casing in a direction opposite to the direction of light emination from said light source,



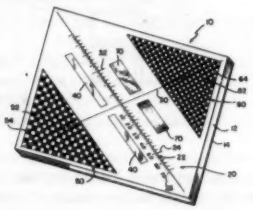
and sensing means fixed within said casing for picking up the light reflected by said second reflex mirror.

4,557,599

CALIBRATION AND ALIGNMENT TARGET PLATE

Bruce Zimring, Costa Mesa, Calif., assignor to General Signal Corporation, Stamford, Conn.

Filed Mar. 6, 1984, Ser. No. 586,704
Int. Cl.⁴ G01J *1/14;* G01B *11/27*
U.S. Cl. 356—243 **20 Claims**



1. A target plate, for precision calibration and alignment of a wafer handling and semiconductor die cutting operating system having optical elements which define a microscopic operating field of view with respect to an operating element for die cutting, comprising a target pattern in said operating field of view having a plurality of substantially coplanar optical targets thereon, at least one of which targets includes a scaled ruling to which said operating element of said system is aligned, and at least two of said coplanar optical targets include reflective means for calibrating said optical elements of said system to assure an evenly illuminated field of view with a minimum of distortion by optical comparison of said two coplanar optical targets.

4,557,600
PROCESS AND DEVICE FOR THE CONTROL AND MIXING OF A FLUID CURRENT SUBJECTED TO CENTRIFUGAL FORCE

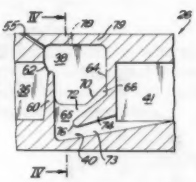
Sigmar Klose, Berg; Manfred Pasch; Wolfgang Kleemann, both of Tutzing; Friedhelm Vieth, Haunshofen, and Herbert Buschek, Weilheim, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Filed Aug. 30, 1982, Ser. No. 413,011

Claims priority, application Fed. Rep. of Germany, Sep. 1, 1981, 3134560

Int. Cl.⁴ G01N *1/10, 21/07*

U.S. Cl. 356—246 **17 Claims**



1. In a device rotatable about an axis of rotation and having a fluid flow canal extending substantially radially outward from an end nearest the axis of rotation and receptive at the end of a volume of fluid for subjecting the same to centrifugal force during rotation, the improvement of fluid controlling and mixing means, comprising: a baffle chamber in the fluid flow canal having a volume sufficiently greater than the volume of the fluid and centrifugal bottom means for forming a steady state fluid surface therein at a first speed of rotation; and outlet canal means in fluid communication with the baffle chamber at one end and having a boundary surface force on the fluid and a portion disposed radially inward of the steady state fluid surface for forcing the fluid from the baffle chamber in response to the boundary surface force when the device is rotating at no greater than a second speed of rotation which is smaller than the first speed of rotation.

4,557,601
ELIMINATION OF GHOST COMPONENT IN FLOW INJECTION ANALYSIS METHOD

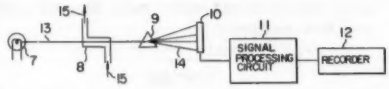
Tadafumi Kuroishi, and Kazuo Yasuda, both of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 22, 1982, Ser. No. 421,377

Claims priority, application Japan, Sep. 24, 1981, 56-149522

Int. Cl.⁴ G01J *3/42*

U.S. Cl. 356—320 **9 Claims**



1. A flow injection analysis method comprising:

a first step of injecting a predetermined amount of a sample into a continuous flow of a carrier solution to form a sample zone therein;

a second step of bringing said sample zone into a flow cell which is irradiated with light from a light source, wherein a combination of a light dispersion means and a photodetector means is disposed behind said flow cell for spectrophotometric measurement;

a third step of separating light transmitted through said sample zone in said flow cell into monochromatic light components of different wavelengths by means of said light dispersion means;

a fourth step of directing aaid monochromatic light components onto said photodetector means at a predetermined time to produce electric absorption signals which are representative of the respective absorptions of said sample zone at said predetermined time for a plurality of wavelengths of light within a predetermined wavelength range; and

a fifth step of producing a difference between the value of a first one of said absorption signals associated with a preselected first wavelength which substantially gives a peak level of absorption and a value related to the value of a second one of said absorption signals associated with at least one preselected second wavelength which gives a smaller level of absorption.

4,557,602
EDGE DETECTOR IN OPTICAL MEASURING INSTRUMENT

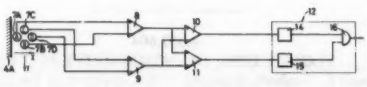
Morimasa Ueda, Kanagawa, Japan, assignor to Mitutoyo Mfg. Co., Ltd., Tokyo, Japan

Filed Apr. 4, 1983, Ser. No. 481,640

Claims priority, application Japan, Apr. 5, 1982, 57-56372

Int. Cl.⁴ G01N *21/30*

U.S. Cl. 356—372 **16 Claims**



1. An edge detector in an optical measuring instrument, for detecting a transmitted light or reflected light to directly or indirectly measure dimensions of an object being measured, comprising:

a sensor including four light receiving elements provided on a plane substantially in parallel with a plane of relative movement between the sensor and said object being measured, whereby at least a first and second set of phase shift signals are generated by said sensor in accordance with brightness and darkness generated during said relative movement, each of said first and second sets comprising at least two signals of different phase; a first and a second operational means for calculating respectively differences between the two signals of the first and second sets of said phase shift signals; a third operational means for calculating a difference between output signals emitted from said first and second operational means; a fourth operational means for calculating a sum of said output signals of said first and second operational means; and a detecting means for generating a crossing signal when an output signal from said third operational means is on a reference level and when an output signal from said fourth operational means is above said reference level.

4,557,603
DETECTION MEANS FOR THE SELECTIVE DETECTION OF GASES, BASED ON OPTICAL SPECTROSCOPY

Oskar Oehler, Streulistrasse 24, Zürich, and Alexis Fries, In der Lachen 11, Dietikon, both of Switzerland

PCT No. PCT/CH82/00026, § 371 Date Oct. 25, 1982, § 102(e) Date Oct. 25, 1982, PCT Pub. No. WO82/02950, PCT Pub. Date Sep. 2, 1982

PCT Filed Feb. 23, 1982, Ser. No. 438,897

Claims priority, application Switzerland, Feb. 25, 1981, 1266/81; Mar. 26, 1981, 2058/81; Jul. 24, 1981, 4853/81; Oct. 29, 1981, 6901/81

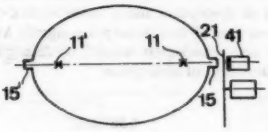
Int. Cl.⁴ G01N *21/17*

U.S. Cl. 356—418 **21 Claims**

1. An optical detection system for selectively detecting gas, comprising:

a light source including an emitter and an ellipsoid reflector shaped as a rotation ellipsoid with a major axis and surrounding two focal points of said ellipsoid, said emitter being located within said reflector adjacent one of said focal points, said reflector having at least one small opening on said major axis for emitting a high intensity light bundle parallel to said major axis;

a gas collecting cell in an optical path of said light source;



a light modulator coupled to said light source;

detector means for generating signals representative of gases detected from light emitted from said gas collecting cell;

a monochromator between said light source and said detector means; and

signal processing means, coupled to said detector means, for analyzing the signals of said detector means.

4,557,604

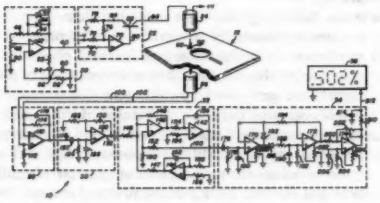
FLOPPY DISK TRANSMISSIVITY METER

Russell L. Gephart, Fremont, Calif., assignor to Verbatim Corporation, Sunnyvale, Calif.

Filed Dec. 26, 1979, Ser. No. 107,177

Int. Cl.[4] G01N *21/00*

U.S. Cl. 356—432 **19 Claims**



1. A meter for measuring the transmissivity of a floppy disk, the meter comprising in combination:

an oscillator for generating a sinusoidal signal;

a driver coupled to said oscillator for developing a modulated biasing signal from said sinusoidal signal;

an LED coupled to said driver for generating a sinusoidally modulated beam of infrared radiation from said modulated biasing signal, said LED being so disposed with respect to the floppy disk as to illuminate at least a portion of the surface thereof;

a photodetector suitably disposed with respect to said floppy disk so as to intercept at least a portion of the LED generated radiation that is transmitted through said floppy disk, said photodetector for generating a radiation detected signal from said intercepted radiation;

coupling means;

a state space type bandpass filter coupled to said photodetector by said coupling means, said filter for developing a filtered signal from those components of said radiation detected signal that have a frequency substantially that of said sinusoidal signal;

detector means coupled to said filter, said detector means for developing a detected filtered signal from the peak excursions of said filtered signal; and

display means coupled to said detector means, said display means for indicating the level of said detected filtered signal, whereby the transmissivity of said floppy disk may be ascertained.

4,557,605

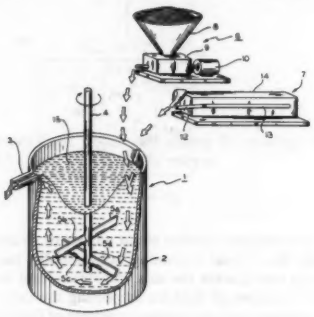
APPARATUS FOR THE CONTINUOUS PRODUCTION OF METAL ALLOY COMPOSITES

Malachi P. Kenney, Chesterfield; Kenneth P. Young, Ballwin, and Alan A. Koch, Overland, all of Mo., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Division of Ser. No. 344,206, Jan. 29, 1982, Pat. No. 4,473,103. This application Aug. 24, 1984, Ser. No. 644,060

Int. Cl.[4] B01F *7/16, 15/02*

U.S. Cl. 366—134 **2 Claims**



1. A high temperature mixer for use in the continuous production of shaped metal alloy-particulate composite comprising

means for containing a mixture of a particulate solid and a molten metal alloy, and defining an upper portion of said mixer,

means in association with said containing means for the vigorous agitation of said particulate solid and molten alloy at a shear rate sufficient to produce a homogeneous mixture of said particulate solid and molten alloy, said agitation means comprising a rotatable shaft extending vertically into said containing means having a plurality of mixing blades mounted thereon, said mixing blades being mounted in pairs and extending horizontally from said shaft, each of said blades being angled from the vertical in a direction opposite from the other blade of said pair,

means in association with said upper portion of said mixer for the continuous introduction of predetermined amounts of said particulte solid and molten alloy into said containing means at a substantially constant ratio, and

discharge means for the continuous discharge of a homogeneous mixture of said molten metal alloy and particulate solid from said mixer.

4,557,606

POWER LINE-OPERATED ELECTRONIC TIME-CLOCK

Alfred Meisner; Werner Arnold, both of Nuremberg; Frank Eggebrecht, Altdorf, and Hans Grasser, Eckental, all of Fed. Rep. of Germany, assignors to Diehl GmbH & Co., Fed. Rep. of Germany

Filed Feb. 1, 1984, Ser. No. 575,815

Claims priority, application Fed. Rep. of Germany, Feb. 9, 1983, 3304386

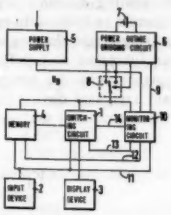
Int. Cl.[4] G04B *1/00*

U.S. Cl. 368—204 **8 Claims**

1. In a line-operated electronic time-clock having a clock switching circuit, a memory for storage of input switching or alarm terms, an input means for entering the input terms, a display means for displaying the input terms, and power outage-bridging circuit including an energy storage means for

supplying power to at least the clock switching circuit and the memory during a power outage; the improvement comprising:

a monitoring circuit connected to the input means and to the



power outage-bridging circuit wherein the monitoring circuit generates a blocking signal in response to the non-actuation of the input means for rendering the power outage-bridging circuit inoperative.

4,557,607

METHOD AND DEVICE FOR STRUCTURAL, SUPERFICIAL AND DEEP ANALYSIS OF A BODY

Gerhard Busse, Sauerlach, Fed. Rep. of Germany, assignor to Carl-Zeiss-Stiftung, Heidenheim/Brenz, Oberkochen, Fed. Rep. of Germany

PCT No. PCT/DE81/00130, § 371 Date Apr. 12, 1982, § 102(e) Date Apr. 12, 1982, PCT Pub. No. WO82/00891, PCT Pub. Date Mar. 18, 1982

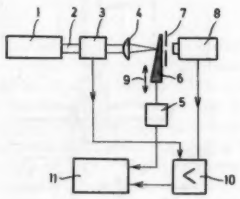
Continuation of Ser. No. 371,300, Apr. 12, 1982, abandoned.

This PCT application Aug. 26, 1981, Ser. No. 632,278

Claims priority, application Fed. Rep. of Germany, Sep. 1, 1980, 3034944

Int. Cl.[4] G01J *5/00*

U.S. Cl. 374—121 **19 Claims**



1. The method of analyzing a body for its surface structure and for its subsurface structure, wherein the body has two opposed surfaces, which method comprises using a cyclically modulated and focused excitation beam to impinge upon and to scan one surface of the body, the focused beam having sufficient intensity to locally induce a thermal modulation within the body and to produce a modulated infrared emanation from the outer surface of the body, measuring amplitude of the modulated infrared emanation in order to obtain an indication of the character of surface structure, and measuring phase shift of the modulated infrared emanation with respect to the modulation cycle of the focused beam in order to obtain an indication of subsurface structure, each of the measurements being as a function of scan displacement.

4,557,608

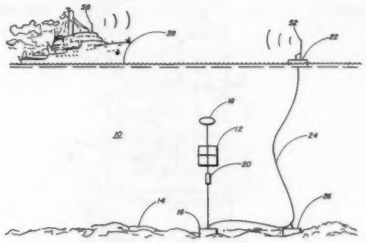
THERMAL MICROSTRUCTURE MEASUREMENT SYSTEM

Michael J. Carver, Bay St. Louis, Miss., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 10, 1984, Ser. No. 608,740

Int. Cl.[4] G01K *7/22, 1/14;* **G01D** *21/00*

U.S. Cl. 374—170 **6 Claims**



1. A system for measurement of the thermal microstructure of water currents, said system comprising:

a planar array having a plurality of thermistors said planar array being maintained normal to a current flow in a body of water, each of said thermistors having at least one current lead and at least one voltage lead;

an electronics package connected to said planar array;

means in said electronics package for sequentially sampling each of said plurality of thermistors;

means in said electronics package for converting data from said thermistors from analog to digital data;

means in said electronics package for processing said digital data and for controlling said sampling and converting means;

a surface buoy floating on said body of water;

cable means, interconnecting said electronics package and said surface buoy, for transmitting said digital data from said electronics package to said surface buoy and for receiving commands from said surface buoy;

means on said surface buoy for telemetering said digital data from said surface buoy to a remote platform and for receiving telemetered commands from said remote platform;

means mounted on said planar array for sensing the conductivity of said fluid medium, the output of said conductivity sensing means being input to said converting means;

means mounted on said planar array for determining the inclination of said planar array, the output of said inclination determining means being input to said converting means;

means for sensing the pressure of said fluid medium from which the depth of said planar array is determined, the output of said pressure sensing means being input to said converting means;

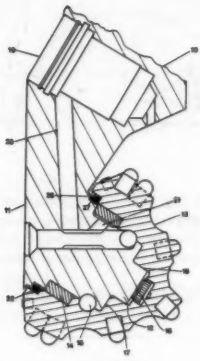
means for determining the direction said planar array is facing, the output of said direction determining means beng input to said processing and controlling means; and

means for selecting under the control of said processing and controlling means which one of said conductivity sensing means, said inclination determining means, said pressure sensing means, said direction determining means and said thermistors is input to said converting means at any particular instant.

4,557,609
ROTARY DRILL BIT

Rolf R. Morén, Sandviken, Sweden, assignor to Santrade Ltd., Lucerne, Switzerland

Filed Mar. 24, 1981, Ser. No. 247,216
Claims priority, application Sweden, Apr. 17, 1980, 8002882
Int. Cl.⁴ F16C 33/78; E21B 9/35
U.S. Cl. 384—94 4 Claims



1. A rotary drill bit comprising a head, at least one roller cutter, said roller cutter being rotatably carried by said head upon bearing means, an annular resilient sealing means disposed in a gap between said head and roller cutter for sealing said bearing means, said sealing means having a sealing surface for sealingly engaging said head and roller cutter, the improvement wherein a first portion of said sealing surface is formed of a first material attached to the sealing means and positioned at a location for engaging said head and avoiding any appreciable engagement with said roller cutter, said first material being of a thickness thin enough to allow deformation thereof caused by axial and/or wobbling movements of the roller cutter relative to the head, a second portion of said sealing surface frictionally engaging said roller cutter and being formed of a resilient second material having a coefficient of friction higher than that of said first material so that the frictional resistance to relative rotation between said sealing means and said roller cutter is greater than the frictional resistance to relative rotation between said sealing means and said head.

4,557,610
DYNAMIC PRESSURE TYPE FLUID BEARING DEVICE

Takafumi Asada, Hirakata; Toshio Onishi, Okayama; Kajuyoshi Senma, Hirakata, and Hideo Matsumoto, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

PCT No. PCT/JP83/00292, § 371 Date May 1, 1984, § 102(e) Date May 1, 1984, PCT Pub. No. WO84/01006, PCT Pub. Date Mar. 15, 1984
PCT Filed Sep. 2, 1983, Ser. No. 609,079
Claims priority, application Japan, Sep. 2, 1982, 57-153005; Dec. 10, 1982, 57-217207
Int. Cl.⁴ F16C 17/10
U.S. Cl. 384—107 4 Claims

1. A dynamic pressure type fluid bearing device comprising:

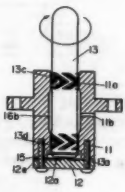
a housing having a first end and a second end, and having an inner surface defining a bearing hole extending from said first end toward said second end;

a shaft having a central axis, an outer surface surrounding said axis opposing said inner surface, and an end surface at said second end, rotatably disposed in said bearing hole; and

a thrust bearing member attached to said second end of said housing, having a thrust bearing surface opposing said end surface of said shaft;

one of said inner surface and said outer surface having first grooves filled with nongaseous lubricant and defining means for creating dynamic pressure in the nongaseous lubricant therein radially with respect to said axis;

said thrust bearing surface having second grooves filled with nongaseous lubricant and defining means for creating dynamic pressure in the nongaseous lubricant therein parallel said axis; said device further comprising means, having a third groove at said second end, extending radially with respect to said axis, between said thrust bearing member and said housing, for providing communication between said bearing hole and the exterior of said device through said third groove, whereby said bearing hole communicates with the outside atmosphere through said third groove and the nongaseous lubricant filling said first and second grooves;

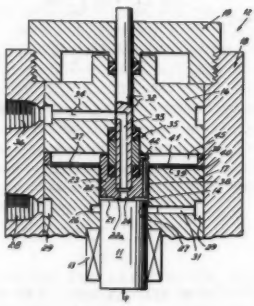


said housing, said shaft and said thrust bearing member bounding a free space between said third groove and said first and second grooves, whereby said space is maintained at atmospheric pressure.

4,557,611
GAS THRUST BEARING

Herbert Sixsmith, Norwich, Vt., assignor to Creare Research & Development Inc., Hanover, N.H.

Filed Aug. 10, 1984, Ser. No. 640,148
Int. Cl.⁴ F16C 17/04, 32/06
U.S. Cl. 384—124 10 Claims



1. A thrust bearing for a shaft mounted in a housing for rotation and limited axial movement, comprising:

a first thrust surface carried by the shaft;

a thrust element having (a) a bearing pad which includes a second thrust surface and (b) a diaphragm portion secured to the housing and supporting the bearing pad to position the second thrust surface in opposition to the first thrust surface, the diaphragm having a front face which faces the second thrust surface;

means for coupling pressurized gas between the thrust surfaces to produce a gap therebetween; and

means for forming a restricted flow path for pressurized gas

between the gap and the front face of the diaphragm, the diaphragm being responsive to variations in pressure applied to its front face to move the bearing pad and the second thrust surface, whereby pressure variations in the gap produced by axial movement of the shaft are coupled through the restricted flow path to vary the pressure applied to the front face of the diaphragm, effecting movement of the second thrust surface which lags the shaft movement to thereby damp oscillations of the shaft.

4,557,612

SEALS FOR BEARINGS

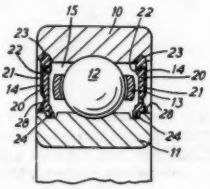
Hubert W. T. Neal, Luton, England, assignor to SKF (U.K.) Limited, Luton, England

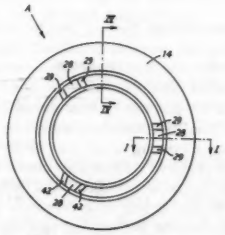
Filed May 14, 1984, Ser. No. 610,253

Claims priority, application United Kingdom, May 19, 1983, 8313912

Int. Cl.⁴ F16C *33/78*; F16J *15/36*

U.S. Cl. 384—488 **12 Claims**





10. A rolling bearing comprising two co-axial bearing members rotatably mounted relative to one another by rolling elements disposed between the two members, one of said bearing members being formed with an annular sealing surface co-axial with the bearing member, and an annular seal mounted on the other bearing member and co-operating with the annular sealing surface to prevent or restrict passage of fluid therebetween, wherein the seal comprises an annular disc-like body of resilient material and an annular reinforcing skirt of rigid material, the side of the sealing surface adjacent the rolling elements is formed with an annular groove, the peripheral surface of the resilient body of the seal is formed with an annular lip which projects into said annular groove, the wall of the annular seal facing away from the rolling elements is formed with one or more protrusions positioned adjacent said sealing surface, and the one or more protrusions has opposing side surfaces which form the leading edges of the protrusion in both directions of relative rotation between the bearing members, said side surfaces converging towards one another in the axial direction away from the rolling elements so that said side surfaces form deflecting surfaces which throw or deflect any debris engaged therewith outwards away from the bearing upon rotation of either of the two members in either direction of rotation.

4,557,613

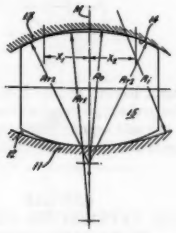
SPHERICAL ROLLER BEARING HAVING RECIPROCAL CROWNING FOR SKEW CONTROL

Tibor E. Tallian, Newtown Square, and Colin G. Hingley, Radnor, both of Pa., assignors to SKF Industries, Inc., King of Prussia, Pa.

Continuation-in-part of Ser. No. 277,099, Jun. 25, 1981, abandoned, which is a continuation of Ser. No. 211,916, Dec. 1, 1980, abandoned, which is a continuation of Ser. No. 938,926, Sep. 1, 1978, abandoned. This application Mar. 9, 1983, Ser. No. 473,534

Int. Cl.⁴ F16C *33/36*

U.S. Cl. 384—568 **9 Claims**



1. In a bearing having inner and outer members with inner and outer raceways spaced apart to define a space therebetween, a complement of rolling elements rotatable about their axes in the space between the raceways, the improvement wherein at least one rolling element has a profile with a predetermined varying curvature, said inner and outer raceways having curvatures of constant radii, said rolling element profile producing a pressure distribution under load resulting in a residual frictional moment producing forces counteracting the externally applied axial load, said rolling elements having a skew angle when the axis of a rolling element and the axis of the bearing are not coplanar and said skew angle being positive when the friction force compnents arising in each contact between said rolling element and raceways and acting on said rolling element in the axial direction, are so directed that they are codirectional to the axial component of the normal contact force acting on said rolling element in the same contact, said rolling element profile curvature varying from a reference datum extending transversely to the axis of the rolling element and disposed adjacent the longitudinal median of the rolling element and wherein said inner and outer raceway curvatures of constant radii are finite.

4,557,614

ANTI-FRICTION BEARING WITH A SEGMENTED CAGE, PARTICULARLY FOR LARGE CYLINDRICAL ROLLER BEARINGS

Bernhard Knappe, Obereuerheim, Fed. Rep. of Germany, assignor to FAG Kugelfischer Georg Schafer Kommanditgesellschaft Auf.Akt., Fed. Rep. of Germany

Filed Oct. 5, 1983, Ser. No. 539,279

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1982, 3241659

Int. Cl.⁴ F16C *33/46*

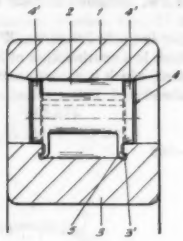
U.S. Cl. 384—573 **5 Claims**

1. A cage for an annular anti-friction bearing, wherein the bearing comprises an outer ring, an inner ring inside the outer ring, and roller members for rolling in races defined by the outer and the inner rings;

the cage comprising a plurality of cage segments which together extend annularly around the bearing and together hold the roller members between the outer and the inner rings;

each segment being shaped for holding a roller member therein; each segment having a plurality of resilient hold-

ing noses formed thereon which extend toward the inner ring for being received at the inner ring; and each segment also being shaped to extend into engagement with the outer ring;



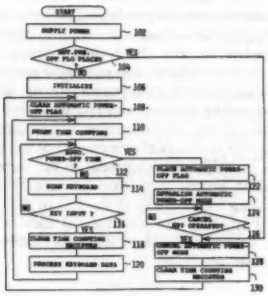
the said segment having axially outer side parts which are the parts thereof that extend to the outer ring, and at the outer ring, the said segment side parts being more sharply curved rounded than the curvature of the outer ring.

4,557,615

ELECTRONIC TYPEWRITER WITH AUTOMATIC POWER-OFF DEVICE

Hideo Ueno, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Continuation of Ser. No. 599,250, Apr. 11, 1984, abandoned. This application May 23, 1985, Ser. No. 737,572
Claims priority, application Japan, Apr. 12, 1983, 58-65000
Int. Cl.[4] B41J *29/38*
U.S. Cl. 400—54 **4 Claims**



1. An electronic typewriter with an automatic power off device, comprising

a main switch for manually turning ON and OFF power to said typewriter;

a printer having a print head capable of moving along a printing line of a recording sheet;

a keyboard having an arrangement of character keys, function keys and other keys for entering code data corresponding to said keys;

memory means for storing various code data entered from said keyboard;

control means for controlling said printer, said keyboard and said memory means;

a counter under the control of said control means and adapted to be counted up at fixed time intervals and to be cleared each time data is entered by keying operation of said keyboard;

means under the control of said control means and responsive to said counter for setting an automatic power off mode wherein operation of said printer and said keyboard are turned off in response to the content of said counter reaching a predetermined value while continuing operation of said memory means and said control means; and

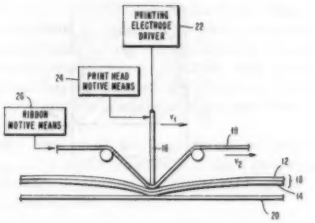
means under the control of said control means and responsive to manual sequential OFF and then ON operation of said main switch during said automatic power off mode for cancelling said automatic power off mode, and for resetting said typewriter including said printer and said memory to a status existing prior to setting of said automatic power off mode, and for activating said typewriter including said printer and said keyboard.

4,557,616

RESISTIVE RIBBON THERMAL TRANSFER PRINTING SYSTEM AND PROCESS

Derek B. Dove, Mount Kisco, N.Y.; Claus D. Makowka, Pembroke Pines, Fla., and Ramon L. Street, San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 12, 1983, Ser. No. 561,010
Int. Cl.[4] B41J *3/04*
U.S. Cl. 400—120 **4 Claims**



1. A resistive ribbon thermal transfer printing system comprising at least one movable printhead electrode,

an electrically conductive movable resistive ribbon in slidable contact with said at least one movable printhead electrode for generating heat in response to said at least one printhead electrode, and a separate ink transfer ribbon containing a coating of ink and being in slidable contact with said resistive ribbon, and means for moving said at least one movable printhead electrode at a velocity v_1 relative to and in the same direction as said ink transfer ribbon and means for moving said movable resistive ribbon at a velocity v_2 relative to and in the same direction as said separate transfer ribbon, such that said resistive ribbon moves relative to and simultaneously with said at least one printhead electrode.

4,557,617

TAPE SUPPLY CARTRIDGE

Michael M. Richardson, Scottsdale, Ariz., and Douglas A. Schaffer, Inver Grove Heights, Minn., assignors to Kroy, Inc., St. Paul, Minn.

Filed Nov. 4, 1983, Ser. No. 549,261
Int. Cl.[4] B41J *3/38, 33/28, 32/00*
U.S. Cl. 400—208 **8 Claims**

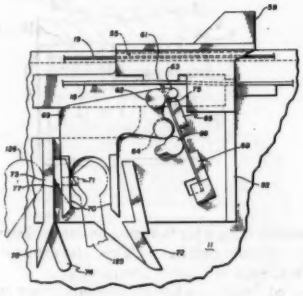
1. A tape supply cartridge for supplying tape to a lettering apparatus comprising:

a cartridge housing including a pair of side walls and a peripheral edge wall extending partially around said cartridge, said cartridge housing further including an opening in said peripheral edge wall to permit access by an elongated, upwardly extending stop arm and an elongated, upwardly extending drive arm of said apparatus;

a supply of tape within said housing;

advancement means for advancing said tape into lettering alignment with said apparatus including a reciprocally moveable shuttle assembly adapted for forward and rear-

ward movement within said housing and carrying tape gripping means for engaging said tape and moving said tape forward during forward movement of said shuttle assembly and for preventing rearward movement of said tape during rearward movement of said shuttle assembly, said shuttle assembly including a forwardly disposed stop surface for engagement with said elongated, upwardly extending stop arm on said apparatus for limiting the forward movement of said shuttle assembly and a drive



cavity having forward and rearward drive surfaces for positive engagement by said elongated drive arm on said apparatus during forward and rearward movement, respectively of said drive arm so that the movement of said shuttle assembly is substantially equal to the corresponding movement of said drive arm, said stop surface and said drive cavity being disposed in generally side-by-side relationship within said cartridge for access by said stop arm and said drive arm through said opening.

4,557,618

INK AND ERASER OF THE INK

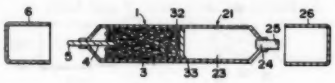
Masahiro Iwata; Yushi Miyashita, both of Koshigaya, and Yuichi Taka, Soka, all of Japan, assignors to Pentel Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 22, 1982, Ser. No. 452,050

Claims priority, application Japan, Dec. 25, 1981, 56-212257; Jan. 28, 1982, 57-11999; Apr. 19, 1982, 57-56625[U]; Apr. 19, 1982, 57-56626[U]; Apr. 30, 1982, 57-63736[U]; Apr. 30, 1982, 57-63737[U]; May 28, 1982, 57-91106; Jun. 11, 1982, 57-100050; Nov. 10, 1982, 57-197404; Nov. 26, 1982, 57-207372; Dec. 1, 1982, 57-211083

Int. Cl.⁴ B43K *27/12, 7/00*

U.S. Cl. 401—34 **22 Claims**



1. A combination made of a writing utensil and an erasing utensil, said combination composed of a first barrel, an ink reservoir provided within said first barrel, an ink passage member for supplying ink from said ink reservoir to the tip of said first barrel and a writing nib provided at the tip of said ink passage member; said ink being stable colored ink being produced from the polar interaction between a developer having a phenolic hydroxyl group and an electron-donating colorless dye capable of developing a color by the action of said developer; and a solvent which does not inhibit a color developing reaction between said developer and said colorless dye; and said erasing utensil composed of a second barrel, an erasing solution reservoir provided within said second barrel, a porous passage member for supplying an erasing solution from said erasing solution reservoir to the tip of said second barrel and an erasing solution coating part which is formed by partly protruding said porous passage member from the tip of said second barrel; said eraser solution comprising a desensitizing polar compound which makes said colored ink colorless.

4,557,619

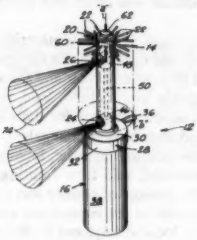
HAIRBRUSH AND AEROSOL SPRAY ASSEMBLY

Cheryl H. DeVincentis, 1012-21 Metropolitan Ave., Forest Hills, N.Y. 11357

Filed May 22, 1984, Ser. No. 612,903

Int. Cl.⁴ A46B *11/02*

U.S. Cl. 401—190 **15 Claims**



1. A hairbrush and aerosol spray assembly comprising:

an aerosol spray can having opposed top and bottom ends, a can nozzle extending from said top end thereof, and mounting means disposed adjacent said top end;

a nozzle assembly detachably mounted to said can nozzle, said nozzle assembly including a plurality of nozzle heads in communication with one another and operative to emit a dispersed spray of material from said spray can;

a brush comprising a generally cylindrical hollow core disposed generally concentrically around said nozzle assembly, a plurality of bristles extending generally radially outwardly from said core, said core being formed with spray aperture means disposed to enable a flow of the spray from said nozzle heads, a base securely attached to said core and detachably mounted to said mounting means on said spray can; and

first and second independently operable activating means for activating the spray, said first activating means comprising an extension integral with said nozzle assembly and protruding beyond the end of said core such that pressure on said extension activates the spray, said second activating means comprising a trigger lever extending through the brush base and detachably mounted to said nozzle assembly, said trigger lever being movable with respect to said base such that movement of said trigger lever causes a corresponding movement in said nozzle assembly to activate the spray.

4,557,620

POUNCE PAD

Raymond E. Hancy, P.O. Box 70412, Eugene, Oreg. 97401

Filed Dec. 24, 1984, Ser. No. 685,891

Int. Cl.⁴ A45D *33/02;* **B41L** *27/26*

U.S. Cl. 401—200 **2 Claims**

1. A device for the application of pounce to a perforated pattern so as to transfer a design to an underlying surface, comprising:

(a) a replaceable pad unit which is comprised of:

(1) a lightweight, nonpermeable core wherein are located a cavity approximate to the center of said core and extending into the core from a face thereof, and having an open surface on said face, said cavity forming a pounce storage reservoir, and multiple open surface pounce distribution channels which are connected to

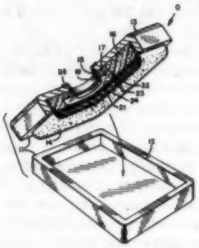
and extend from the open surface of said pounce storage reservoir, said distribution channels providing both additional pounce storage volume and an unobstructed pathway for the distribution of pounce toward more distant portions of the face of said core;

said core also including an opening formed in said core from the bottom center of the said internal storage reservoir and continuing through the said core to the opposing surface thereof, said opening forming a portion of a pounce loading access channel in combination with an adjacently located and corresponding opening formed in the containing vessel, so that by introducing pounce through said opening formed in the containing vessel and hence through the said opening formed in the core, the pounce will enter said internal storage reservoir;

(2) open mesh, rigid, screening material, located adjacent to the face of the core wherein the open surfaces of the said pounce storage reservoir and the said pounce distribution channels are located, said screening material serving as a support surface for the said pounce storage reservoir and distribution channels;

(3) pounce-flow limiting material, located adjacent to said screening material, said flow limiting material serving to restrict the passage of pounce and to limit the amount of pounce available for subsequent permeation;

(4) a foam pad, located adjacent to the said flow limiting material, said foam pad, being permeable to pounce, serving to evenly distribute, through its compressible



surface, that pounce which penetrates the said flow limiting material; and

(5) a cloth covering of brush-type cloth which distributes, in conjunction with a rubbing motion, that pounce which has been emitted from said foam pad, so that the pounce is applied to the perforated pattern in such a manner as to create a useful image on the underlying surface;

wherein the said cloth covering encompasses the said foam pad, flow limiting material, screening material, and core face, and is securely attached to the sides of the core so as to create a replaceable pad unit;

(b) a hollow vessel of hand-grasping size, which is divisible into two (2) parts, wherein one part, as a cover, is removable and serves to protect the contents when not in use, and the second part holds the contents by a secure fit and also acts as a handle during use when grasped in the hand of the user;

said second part also having an opening formed in its outer surface for the purpose of establishing, in conjunction with the said adjacent and corresponding opening formed in said core, the said external pounce loading access channel; and

(c) a plug which tightly fits and penetrates the opening formed in said containment vessel and the said corresponding opening formed in the said core, thereby sealing the pounce access channel, such plug being readily removable and reinsertable when the device requires reloading with pounce.

4,557,621

CLAMPING DEVICE

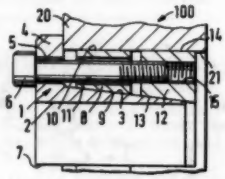
Ralph Müllenberg, Im Wiesengrund 6, D-4048 Grevenbroich 12, Fed. Rep. of Germany

Filed Nov. 7, 1984, Ser. No. 668,906

Claims priority, application Fed. Rep. of Germany, Dec. 1, 1983, 3343446; Sep. 21, 1984, 3434690

Int. Cl.⁴ F16D *1/06*

U.S. Cl. 403—16 **6 Claims**



1. A clamping device for fastening an external structural part to an inner structural part having a circular external circumferential surface, such as a shaft, comprising:

(a) a tapered flange ring having a circular inner circumferential surface, a radially disposed conical circumferential outer surface and a radial flange projecting from said conical circumferential surface;

(b) a conical part having a conical tapered surface cooperating with the conical circumferential surface of said tapered flange ring;

(c) at least a plurality of axial clamping screws passing through said flange and engaging said conical part;

(d) said tapered flange ring having at least one further conical part with a tapered circumferential surface cooperating with the tapered surface of said tapered flange ring; and

(e) said further conical part being capable of being clamped to said tapered flange ring or forced from it by said plurality of screws.

4,557,622

ADJUSTABLE TORQUE ROD

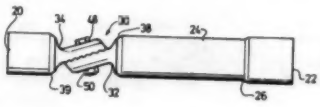
Wallace G. Chalmers, 10 Avoca Ave., Ste. 1504, Toronto, Ontario, Canada M4T 2B7

Filed Mar. 7, 1984, Ser. No. 586,898

Claims priority, application United Kingdom, Mar. 12, 1983, 8306847

Int. Cl.⁴ F16B *7/18*

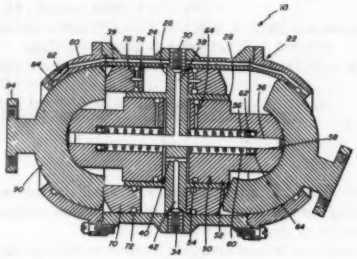
U.S. Cl. 403—388 **4 Claims**



1. An adjustable torque rod comprising, in combination, an elongated rod having a longitudinal axis; securing means formed at each end of the rod; and adjustment means formed intermediate the securing means, said adjustment means comprising a pair of identical mating components each having an end portion affixed centrally to a securing means or to the rod, a body portion having a plurality of serrations transverse to the longitudinal axis of the rod formed integral with each end portion whereby the body portion of one mating component intermeshes with the body portion of the other mating component for longitudinal adjustment, each body portion having said transverse serrations formed on a generally planar surface, said surface inclined at an angle up to about 40° to the longitu-

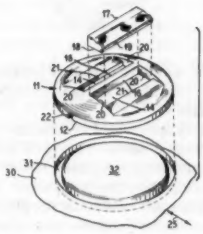
dinal axis of the rod, fastening means comprising a longitudinal mating slot formed centrally in each component body portion, and a bolt adapted to extend through said mating slots substantially perpendicular to the generally planar surfaces for securing said mating components together.

4,557,623
ROBOTIC WRIST
Richard P. Tella, Hartford Ave., Wakefield, R.I. 02879
Filed Jan. 13, 1983, Ser. No. 457,522
Int. Cl.[4] F16D *3/80*
U.S. Cl. 403—31 **13 Claims**



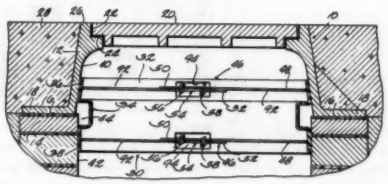
1. A linkage device adapted to be secured at one end to a robot arm and to be secured at its other end to a workpiece gripper which comprises:
a housing having one end and another end, an outer wall and an inner wall and a plate member joined to the inner and outer walls, said plate member intermediate the one end and the other end;
link means including a first link secured to the one end of the housing for angular motion;
means to lock the link in an arbitrary fixed position, said means to lock disposed within the inner wall for fluid tight sliding motion within the inner wall and along the longitudinal axis of the housing;
means to align the link in a standard resettable position said means disposed between the inner and outer walls for fluid tight sliding motion between said inner and outer walls;
means to create a fluid bearing surface between the link and the housing; and
means to move the means to lock the link and the means to align the link.

4,557,624
SNOW PLOWABLE PAVEMENT MARKER
Floyd E. Walker, 423 Balsam La., Palatine, Ill. 60067
Filed Sep. 9, 1983, Ser. No. 530,610
Int. Cl.[4] E01F *9/06*
U.S. Cl. 404—14 **3 Claims**



1. A reflector for surface mounting on a roadway comprising a circular plate with a generally flat undersurface with a peripheral annular flange depending therefrom for insertion in and adhesive attachment to an annular trough in the road surface, said flat undersurface extending to said flange throughout its periphery whereby substantially the entire flat surface rests upon and is adhesively attached to the road surface, a generally annular sloping upper surface on said plate providing a centrally positioned rounded mound surface, a reflector cavity formed in said mound and comprising a generally straight side wall adjacent the diameter and end walls perpendicular thereto, the bottom of said cavity being adjacent said undersurface, and reflector means secured in said cavity with the upper surface thereof located below the top of said straight side wall, and the lower surface located adjacent the road surface.

4,557,625
INTERNAL SEALING ASSEMBLY
Richard P. Jahnke, 1002 Hawthorn Dr., Waukesha, Wis. 53186; James C. Keuper, 1950 Church View Dr., Brookfield, Wis. 53005, and Wayne E. Hunnicutt, P.O. Box 62, Big Bend, Wis. 53103
Filed Jun. 29, 1983, Ser. No. 509,198
Int. Cl.[4] E02D *29/12*
U.S. Cl. 404—25 **15 Claims**



1. A sealing assembly for internally sealing the joint between hollow members having a generally circular inside diameter, said sealing assembly including
a flexible tubular sleeve having an axial length sufficient to span the joint and opposite end portions respectively including first and second sealing portions, said sealing portions having an outer surface adapted to sealingly engage the interior wall of the members at locations axially spaced from the opposite sides of the joint; and
a pair of adjustable expansion units, each adapted to fit inside a respective one of said first and second sealing portions and including
a generally circular hoop made from a rod-like member and having end portions which vertically overlap with one end portion being located above the other and which are circumferentially movable relative to each other,
a first radially inwardly extending bracket affixed on one end portion of said hoop,
a second radially inwardly extending bracket circumferentially spaced from said first bracket and affixed on the other end portion of said hoop, and
tightening means for adjustably moving said first and second brackets toward each other and thereby increasing the circumference of said hoop to radially compress said outer surface of the respective sleeve sealing portion into sealing engagement with the interior wall of a member.

4,557,626
ROAD PATCHING VEHICLE
Jack E. McKay, and Robert E. Brown, both of Hayden Lake, Id., assignors to Road Renovatcrs, Inc., Hayden Lake, Id.
Continuation-in-part of Ser. No. 422,750, Sep. 24, 1982, abandoned. This application May 7, 1984, Ser. No. 607,923
Int. Cl.[4] E01C *23/09*
U.S. Cl. 404—90 **25 Claims**

1. A roadway patching vehicle for repairing broken or oth-

erwise damaged roadway surface areas bounded by undamaged useful roadway surface, the vehicle comprising:

a wheel supported frame having a front pair of wheels at a front frame end and a rear pair of wheels adjacent a rear frame end;

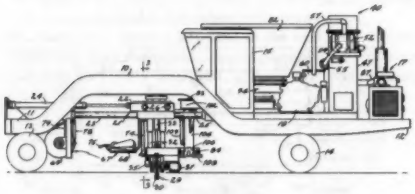
an operator's station on the frame;

a tool support carriage on the frame between the front and rear wheels in view from the operator's station, selectively movable under the frame within an area substantially confined by the frame between the front and rear wheels and viewable from the operator's control station;

a roadway surface cutter head on the tool carriage for movement with the carriage and operable to cut through an existing roadway surface at a damaged area thereof to break the damaged roadway surface into loosened fragments and to form a cavity bounded by useful roadway surface;

torch means on the carriage for movement therewith for insertion into a roadway cavity to heat and dry exposed cavity surfaces;

a vacuum head on the carriage independent of the cutter head for insertion into a cavity formed by the cutter head to receive surface fragments from operation of the cutter



head, existing surface water at the damaged area, or other debris or liquid found at the site of the damaged roadway surface area;

collector means on the frame operatively connected to the vacuum head for supplying vacuum pressure through the vacuum head to collect surface liquids or particulates including the loosened fragments removed by the cutter head;

a hopper in fixed position on the frame for receiving roadway repair materials;

extendible delivery means leading from a fixed end on the fixed hopper to a movable discharge end on the carriage, for movement responsive to movement of the carriage and for receiving roadway repair material from the fixed hopper and delivering it through the movable discharge end;

an applicator head on the tool carriage for movement with the carriage for receiving material from the discharge end of the delivery means and for filling the cavity prepared by the cutter head; and

finishing means on the carriage for movement therewith to prepare a new surface on the roadway repair material discharged by the delivery means.

4,557,627

APPARATUS AND METHOD FOR TUNNEL CONSTRUCTION WITH SHIELD DRIVE

Walter A. Schmid, Uetikon am See, and Hans Bertschinger, Dubendorf, both of Switzerland, assignors to Locher & Cie AGZZ, Zurich, Switzerland

Continuation of Ser. No. 114,090, May 24, 1979. This application Feb. 12, 1982, Ser. No. 348,650

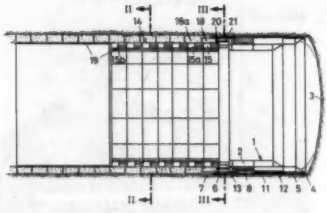
Int. Cl.⁴ E21D *9/06, 11/10*

U.S. Cl. 405—146 **2 Claims**

1. A tunnel construction apparatus for cutting a tunnel and forming a concrete lining for a wall therein, said apparatus having a cylindrical tunnel shield with a cutter on the leading edge, a casing, a fixed tail and means for continuously moving said shield forwardly through the earth, characterized by:

an auxiliary movable tail extending rearwardly from said fixed tail, said auxiliary tail having a plurality of independently movable segments;

means for moving each of said auxiliary tail segments individually forwardly and rearwardly with respect to said shield, said auxiliary tail segments being moved rearwardly of the fixed tail to support the earth as the shield



and fixed tail advance and said auxiliary tail segments being moved forwardly as the associated segment of a section of the tunnel wall is concreted;

a plurality of frontal concrete framing members, one associated with each of the segments of the auxiliary tail to define therewith an enclosure for concreting a segment of a section of the tunnel wall; and

means for moving each of said frontal framing members individually forwardly and rearwardly with respect to said shield.

4,557,628

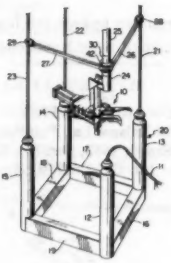
METHOD AND APPARATUS FOR REMOTELY CUTTING BROKEN UNDERWATER GUIDELINES

William S. Cowan, Houston, Tex., assignor to Armco Inc., Middletown, Ohio

Continuation of Ser. No. 311,287, Oct. 14, 1981, abandoned. This application Mar. 28, 1984, Ser. No. 594,418

Int. Cl.⁴ B63C *11/10*

U.S. Cl. 405—191 **15 Claims**



1. A method for remotely cutting a broken guideline which extends from the top of an upright underwater guide post, comprising the steps of:

lowering a cutting apparatus from the surface of the body of water to a location below the top of the guide post, the cutting apparatus comprising movable cutting means,

slidably connecting the cutting apparatus to the guide post,

raising the cutting apparatus along the guide post to a predetermined location on the guide post wherein the movable cutting means is in a plane immediately above the top of the guide post, and

remotely actuating the cutting apparatus to cause the movable cutting means to move across the top of the guide

post and sever the broken guide line immediately adjacent to the top of the guide post,

the remotely actuating step being preceded by the step of rigidly clamping the cutting apparatus to the guide post.

4,557,629

OFFSHORE TOWER STRUCTURES

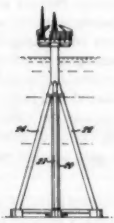
Jan Meek, Gouda; Maurice Uittenbogaard, AV Woerden, both of Netherlands; Finn C. Michelsen, Kailua, Hi., and Pieter S. Heerema, deceased, late of Wassenaar, Netherlands by E. P. Heerema, executor, assignors to Heerema Engineering Service BV, Netherlands

Continuation of Ser. No. 354,710, Mar. 4, 1982, abandoned. This application May 4, 1984, Ser. No. 606,964

Claims priority, application United Kingdom, Mar. 4, 1981, 8106753

Int. Cl.⁴ E02B *17/00*; E02D *23/02, 25/00*

U.S. Cl. 405—204 **6 Claims**



1. An offshore tower comprising:

a base structure for positioning on the sea bed, said base structure including a central column foundation unit, the latter being formed with a vertically extending central recess, said base structure also having a plurality of horizontally extending leg foundation units each formed at points spaced horizontally from the central column unit with a plurality of upwardly facing wedge-shaped leg recesses;

a vertically disposed central enclosed tubular column containing services such as conductors and risers, the lower end of said column slideably extending into the central recess of the base structure to an initial depth when said column is first lowered thereinto, and said base structure extending to above the sea level to support a service platform;

at least three tubular support legs having their lower ends connected to said leg foundation units by insertion within said leg recesses when said legs are lowered vertically thereinto, the connection between said leg recesses and the lower end of said legs permitting said legs to be swung from a vertical position towards said column;

a nodal structure on said column having downwardly and outwardly extending projections formed with collars at their lower ends of larger diameter than the legs that slideably receive the upper end of each of said legs; and

a saddle on each said collar disposed adjacent the column and formed with a downwardly and outwardly extending surface, with the upper end of said legs being swung from a generally vertically extending initial position inwardly towards said column and into their respective collars in abutment with the lower end of the nodal structure, as the column is lowered to a second depth lower than its initial depth and with the upper end of the legs being guided into their respective collars by engagement with the downwardly and outwardly extending surfaces of the saddles for attachment to the structures.

4,557,630

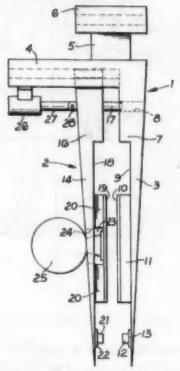
VIBRATORY CLAMPING DEVICE FOR USE WITH AN EXCAVATOR IN SUPPORTING AND PLACING SHEETING WHEN EXCAVATING IN SAND, RUNNING SAND AND SILT

Joseph S. Neil, 270 Cameron Crescent, Bonnyrigg, Midlothian, Scotland

Filed Jun. 11, 1984, Ser. No. 619,267

Int. Cl.⁴ E02D *7/20*

U.S. Cl. 405—232 **5 Claims**



1. A vibratory clamping device for use with an excavator in supporting and placing sheeting when excavating in sand, running sand and silt, the device comprising a first portion adapted to be suspended from the mounting for the excavator bucket and including a first jaw and a guideway, a second portion including second jaw and a slide slidable within the guideway in moving the second jaw towards and away from the first jaw, formations on one of the jaws for engagement with corresponding formations on the sheeting to enable the sheeting to be suspended between the jaws, opposing plates resiliently mounted on the respective jaws for engagement with opposite sides of the sheeting, vibratory means mounted on one of the jaws for vibrating the plate mounted on that jaw so that when the jaws are closed on the sheeting both plates and the sheeting engaged therebetween are vibrated, and means for moving the second jaw towards and away from the first jaw.

4,557,631

OFF-CENTER ROCK BOLT ANCHOR AND METHOD

David C. Donan, Jr., Rte. #1, Manitou, Ky. 42436, and David M. Donan, 601 Sharon Garden Ct., Woodbridge, N.J. 07095

Filed Aug. 29, 1983, Ser. No. 526,959

Int. Cl.⁴ E21D *20/00, 21/00*; F16B *13/06*

U.S. Cl. 405—259 **7 Claims**

1. An expansion shell assembly for use with a roof or rock bolt, said expansion shell assembly comprising in combination:

(a) wedge nut means for receiving a threaded end of the bolt, said wedge nut means having an off-center threaded hole therein for receiving said threaded end, a major portion of said wedge nut means being disposed on one side of said off-center threaded hole;

(b) expansion wing means, slidably disposed about said wedge nut means, for expanding to engage a bolt hole wall in response to rotation of the bolt relative to said wedge nut means;

(c) a flat upper surface on said wedge nut means;

(d) anchoring means, pivotally connected to a pivot point on said flat upper surface, and extending outwardly from said major portion of said wedge nut means, for anchoring said expansion wing means to a first portion of a bolt hole wall

by pivoting in the plane of said flat upper surface and moving toward the first portion of the bolt hole wall in response to initial eccentric rotation of said wedge nut means about said bolt; and

(e) pivot means for pivoting said wedge nut means about said

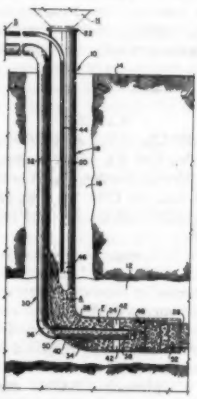
anchoring means to force a portion of said wedge nut means that is spaced from said pivot point against a second portion of the bolt hole wall opposite to said first portion thereof in response to further rotation of said bolt and wedge nut means, to prevent further rotation of said expansion shell assembly as said bolt continues to rotate.

4,557,632

COMPACTING APPARATUS

Charles Penny, Belleville, Ill., assignor to Bernard M. McMenamy, St. Charles, Mo.

Filed Dec. 15, 1983, Ser. No. 562,192
Int. Cl.⁴ E02D *3/02, 5/18, 29/00*
U.S. Cl. 405—267 **4 Claims**



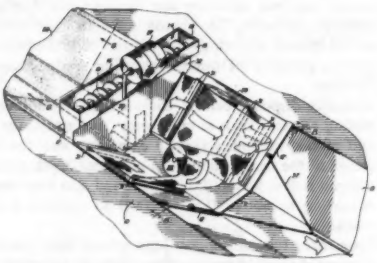
1. A compacting apparatus for use in charging earth cavities, said apparatus including a material supply line having an upright portion incorporating an upper end inlet for receiving the fill material and terminating downwardly in a generally horizontal transverse arm portion connected at one end to the lower end of said upright portion and extending outward therefrom and terminating at its other end in a discharge opening in spaced remote relation from said upright portion, air supply means including an air line incorporating a forward discharge portion mounted within the material supply line transverse arm portion, said forward discharge portion including nozzle means disposed within said horizontal arm portion and directed in a downstream direction toward the discharge opening of material supply line, said material supply line transverse arm portion including a circumferentially disposed chamber to which air is supplied from said air supply line and disposed substantially in the vicinity of said nozzle means, said chamber having a a plurality of air outlet openings directing air into the material supply line in a downstream direction toward said discharge opening, said material supply line including an inner circumferential wall portion, said circumferentially disposed chamber including forward and rearward oppositely inclined truncated cone-shaped plates attached at their major diameter ends to said wall portion and to each other at their minor diameter ends, said forward plate including means defining said air outlet openings and being sharply forwardly and outwardly inclined, said rear plate being only slightly forwardly and inwardly inclined, the diameter of said transverse portion of the material supply line being greater than the diameter of the upright portion thereof to provide a net cross-sectional area of said transverse portion substantially as great as the cross-sectional area of said upright portion to facilitate flow through said transverse portion of said material supply line, the transverse portion of the material supply line including a diametrically reduced end portion downstream from said chamber and nozzle means defining said discharge opening, said discharge opening being of substantially the same inside cross-sectional area as said upright portion.

4,557,633

PORTABLE FORM FOR LINING IRRIGATION DITCHES

John W. Dyck, Box 158, Lethbridge, Alberta, Canada T1J-3Y5

Filed Aug. 1, 1983, Ser. No. 519,534
Int. Cl.⁴ E02B *5/02*
U.S. Cl. 405—268 **10 Claims**



1. A portable sliding form for lining prepared earthen ditches having a bottom and slanting sides of predetermined sectional shape with reinforced cement comprising:

a skid formed of flat plates to provide a flat bottom and outwardly slanting sides conforming to the sectional shapes of the prepared ditch,

said plates forming a prow at the forward end and terminating at the rear end to provide a trowling surface,

a hopper formed on said skid between its ends by transversely upward extending spaced side members and end members,

a cement deposit vent means cut in the rear mounted side member of said hopper adjacent to and along said bottom and said slanting sides of said skid,

a trowling plate extending rearwardly of said rear mounted side member of said hopper and across and spaced from the bottom and slanting sides of the ditch a distance relating to the thickness of the desired concrete web being poured,

a rectangular entrance means cut in the front mounted side

member of said hopper adjacent said bottom and slanting sides of said skid, and

wire mesh dispensing means mounted on said skid forwardly of said hopper in its direction of movement for dispensing wire mesh rearwardly through said entrance means into and through said hopper and out of said cement deposit vent means substantially within the center of the cement web being poured.

4,557,634

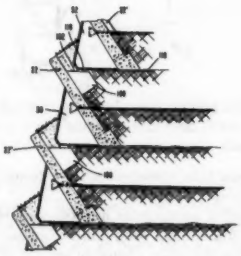
WALL STRUCTURE AND METHOD OF CONSTRUCTION

Henri Vidal, 8 bis Boulevard, 92200 Neuilly-Sur-Seine, France

Continuation-in-part of Ser. No. 457,160, Jan. 11, 1983, abandoned. This application Dec. 28, 1983, Ser. No. 566,471

Int. Cl.⁴ E02D *29/02, 17/00;* **A01G** *9/02*

U.S. Cl. 405—286 **14 Claims**



1. A retaining wall structure comprising:

a plurality of wall facing elements, said elements being elongated and having upper and lower horizontal edges, opposing ends, front and rear faces and a substantially greater height than thickness, said facing elements being arranged in end to end relation in courses;

a plurality of reinforcing elements, said reinforcing elements including means for connecting a reinforcing element with a facing element, said reinforcing elements extending rearwardly from said facing elements in substantially horizontal layers;

particulate material interposed rearwardly of said facing elements and about said reinforcing elements, said particulate material being stabilized by frictional engagement between said material and said reinforcing elements;

said facing elements being in vertically adjacent courses defining a wall face, the facing elements in one course having the lower horizontal edge spaced rearwardly of the upper horizontal edge of the next lower course, a portion of said particulate material being situated between the lower edge of facing elements in one course and the rear face of the facing elements of the next lower course, said portion defining at least one strip suitable for use as a planting area, and said facing elements having a buttress projecting from said front face intermediate of said opposing ends, said buttress projecting toward, but spaced from, the upper edge of the facing element of the next lower course and being proportioned to permit a substantially vertical face; and

wherein each facing element includes a bearing pad extending rearwardly from the facing element in general vertical alignment with the buttress such that the buttress of one wall facing element rests on the bearing pad of a second wall facing element.

4,557,635

SHIELD-TYPE SUPPORT FRAME

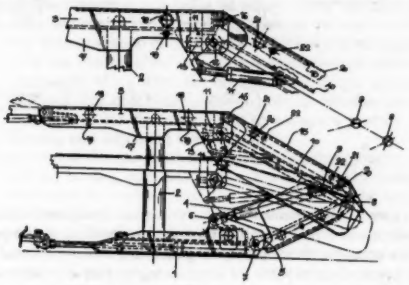
Willy Watermann, and Winfried Hachenberg, both of Dortmund, Fed. Rep. of Germany, assignors to Klockner-Becorit GmbH, Castrop-Rauxel, Fed. Rep. of Germany

Filed Nov. 29, 1983, Ser. No. 556,186

Claims priority, application Fed. Rep. of Germany, Dec. 1, 1982, 3244438

Int. Cl.⁴ E21D *15/44*

U.S. Cl. 405—296 **2 Claims**



1. A shield-type support frame for a mine roof comprising:

(a) a bottom structure;

(b) a one-piece roof cap;

(c) at least one hydraulic plunger connecting said roof cap to said bottom structure;

(d) two shield elements in the form of narrow beams arranged side by side, each separately adjustable in height relative to the other, said shield elements being pivotally connected to said bottom structure;

(e) a pivotal connection connecting each of said shield elements to said one-piece roof cap which includes a hinge connection having a first hinge pin extending in the face length direction supporting said shield element and a second hinge pin extending in the forward direction supporting said one-piece roof cap, so that said roof cap may be pivoted relative to said shield elements about axes extending in the forward direction; and

(f) a cover plate adapted to rest on said shield elements and be movable relative thereto connected to said roof cap by a hinge having a pivot axis extending in the face length direction.

4,557,636

INJECTION OF SOLIDS INTO A HIGH PRESSURE SLURRY STREAM

Jeffrey L. Beck, and Ahmed A. El-Saie, both of Ponca City, Okla., assignors to Conoco Inc., Ponca City, Okla.

Continuation-in-part of Ser. No. 439,670, Nov. 8, 1982, Pat. No. 4,453,864. This application Mar. 26, 1984, Ser. No. 593,019

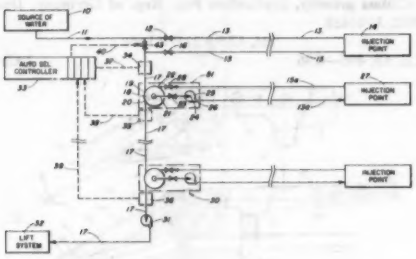
The portion of the term of this patent subsequent to Jun. 12, 2001, has been disclaimed.

Int. Cl.⁴ B65G *53/30*

U.S. Cl. 406—19 **7 Claims**

1. A multipoint injection system for first and succeeding slurry sources, said system having a source of water connected to said first slurry source with a slurry from said first slurry source coupled to a main slurry line, controllable bypass valve means coupled between said source of water and said main slurry line, vortex junction apparatus at a location servicing each succeeding slurry source, said vortex junction apparatus having a high pressure inlet and a high pressure outlet, a low pressure outlet and a slurry inlet, means coupling each vortex junction apparatus in series with said high pressure inlet and said high pressure outlet coupled in series with said main slurry line, and means coupling said last vortex high pressure outlet to

a transfer system, means for coupling each of said low pressure outlets to said corresponding slurry source for supplying fluids to said slurry source and means for coupling slurry from said slurry source to said corresponding vortex junction apparatus



slurry input, flow measuring means coupled to said main slurry line from said first slurry source and generating an output, means accepting said output and generating a control signal to said bypass control valve for maintaining said flow in said main slurry line at a predetermined value.

4,557,637

SOLIDS TRANSFER SYSTEM

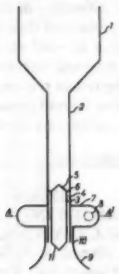
John L. Barclay, Tadworth; Geoffrey C. Stevens, London; Brian Stokes, Sunbury-on-Thames, and Denis S. Ward, Walton-on-Thames, all of England, assignors to The British Petroleum Company Limited, London, England

Continuation of Ser. No. 70,441, Aug. 28, 1979, abandoned. This application Nov. 16, 1983, Ser. No. 552,425

Claims priority, application United Kingdom, Sep. 13, 1978, 36696/78; Jun. 15, 1979, 7921042

Int. Cl.⁴ B05B *7/14*

U.S. Cl. 406—153 **7 Claims**



1. Apparatus for transferring solid particles to a receptacle from a storage hopper by allowing said particles to flow and drop down in a loading tube provided with a cylinder disposed within the lower end thereof and forming an annulus therewith and fall freely from said annulus, said apparatus comprising a loading tube having an inlet and an outlet, a gas supply chamber terminating in a curved Coanda surface surrounding said loading tube at or near the base thereof, a slot located between the outlet of said loading tube and the beginning of said curved Coanda surface, said curved Coanda surface being substantially continuous with one wall of said slot and forming a Conada nozzle therewith, and a cylinder disposed within the lower end of said loading tube, coaxially aligned therewith and forming therewith an annulus to direct particle flow through said loading tube close to said Coanda nozzle and to control the rate of supply of particles.

4,557,638

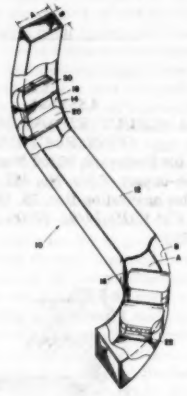
PNEUMATIC TUBE CONVEYOR

Paul J. O'Neill, 1095 Bel Marin Keys Blvd., Novato, Calif. 94947

Filed Apr. 6, 1984, Ser. No. 597,494

Int. Cl.⁴ B65G *51/06*

U.S. Cl. 406—186 **6 Claims**



1. A pneumatic tube conveyor system comprising:

a length of tubing;

said tubing being rectangular in cross-section and having a short dimension and a long dimension; and including

at least one first direction-changing section of tubing curved with short dimensions thereof disposed along radii of said curve;

and hollow carriers to be transported through said tubing;

each hollow carrier comprising:

a pair of generally cylindrical fore and aft members the axes of which are parallel and transverse to the direction of movement of said carrier;

each said cylindrical member being of a radius equal to one-half said short dimension to engage opposing surfaces of said tubing on said long dimension thereof and of a length equal to said long dimension, so that ends thereof engage opposing inner surfaces of said tubing on said short dimension thereof; and

a generally rectangular intermediate section interconnecting said fore and aft generally cylindrical members and being of a thickness and width less than said short and long dimensions, respectively.

4,557,639

CUTTING TOOL FOR PLANING GEAR TOOTH FLANKS

Rudolf Fischer, Mutschellen, Switzerland, assignor to Maag Gear-wheel & Machine Company Limited, Zürich, Switzerland

Filed Feb. 13, 1984, Ser. No. 579,474

Claims priority, application Switzerland, Feb. 18, 1983, 925/83

Int. Cl.⁴ B23F *5/16*; B23C *5/20*

U.S. Cl. 407—20 **10 Claims**

1. A cutting tool for planing gear tooth flanks on a roughed-out or pre-formed gear blank, comprising:

a cutting tool insert holder;

a plurality of cutting tool inserts fastened to said cutting tool insert holder;

said cutting tool having a cutting direction;

each of said plurality of cutting tool inserts having a cutting face and a clearance face;

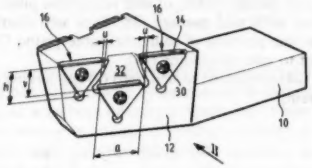
a junction being formed between said cutting face and said clearance face;

each of said plurality of cutting tool inserts having an active primary cutting edge formed by said junction of the cutting face and the clearance face thereof;

each of said active primary cutting edges having a longitudinal extent;

at least two of said plurality of cutting tool inserts being mutually displaced substantially in said cutting direction such that said longitudinal extents of the active primary cutting edges thereof overlap;

at least one of said at least two mutually displaced cutting tool inserts being rearwardly displaced in said cutting direction with respect to at least one other of said at least two mutually displaced cutting tool inserts;



at least one recess provided in said cutting tool insert holder for clearing waste material removed from the gear tooth flanks by said at least one rearwardly displaced cutting tool insert;

each of said plurality of cutting tool inserts comprising a support layer of hard metal and a surface layer of very hard polycrystalline cutting material sintered thereupon;

said surface layer having an outer face and at least three side faces;

said outer face of the surface layer forming said clearance face;

one of said at least three side faces of the surface layer defining at least part of said cutting face; and

said longitudinal extents overlapping by not less than 0.5 mm and not more than 6 mm.

4,557,640

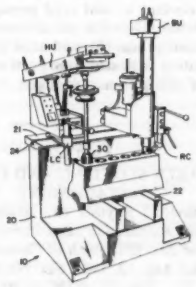
COMBINATION BORING AND HONING APPARATUS AND METHOD

Donald B. Rottler, 2423 8th Ave. N., Seattle, Wash. 98109

Filed Mar. 13, 1978, Ser. No. 885,651

Int. Cl.[4] B23B *41/12*; B24B *33/02*

U.S. Cl. 408—27 **6 Claims**



1. In combination,

an elongated rigid bed having a lower support area for an engine block and an upper slideway laterally offset relative to the support area, said slideway having a central area opposite the support area and having end areas at its opposite ends located endwise beyond the support area,

a first engine block clamping unit, a cylinder boring unit, and a cylinder honing unit mounted to move independently along said slideway and arranged in the recited order, said first clamping unit and boring unit being adapted to occupy the other of said end areas whereby all of the cylinders of an engine block in the support area can be successively bored and honed,

a second engine block clamping unit on the honing unit,

said first clamping unit being swingable from said one end area into engine block clamping position without interfering with operation of the boring unit when the boring unit is in the central area, and being movable out of reach of the engine block when the boring unit is moved into said one end area after boring of the adjoining cylinder bore to make room for the honing unit to occupy a position for honing said adjoining bore,

said second clamping unit being swingable from side to side of the honing unit into engine block clamping position such that an engine block can be clamped by the second clamping unit on the boring unit side of the honing unit when the honing unit is in said other end area to make room for the boring unit to operate on the adjacent cylinder bore, and can be clamped by the second clamping unit at a location in the central area together with the honing unit or alone when the honing unit occupies said one end area, whereby both of said clamping units can be in engine block clamping position at opposite sides of the boring unit whenever the boring unit is operating alone in the central area or when both the boring unit and the honing unit are operating in the central area, and whereby the second clamping unit can always be in engine clamping position adjacent the bore being honed whenever the honing unit is operating in the central area.

4,557,641

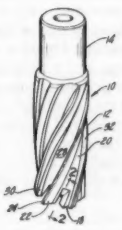
ANNULAR CUTTER

Everett D. Hougen, G-5072 Corunna Rd., Flint, Mich. 48504

Filed Sep. 12, 1983, Ser. No. 531,083

Int. Cl.[4] B23B *41/02*

U.S. Cl. 408—204 **9 Claims**



1. An annular hole cutter having a cylindrical side wall provided with a plurality of teeth spaced circumferentially around the lower end thereof and a plurality of flutes extending upwardly around the outer periphery of said side wall from the lower end thereof, each tooth being connected with the next successive tooth by a circumferentially extending web at the inner periphery of said side wall, said webs being juxtaposed radially with said flutes so that the radially outer face of each web comprises the radially inner face of the radially adjacent flute, each flute having generally radially extending leading and trailing side walls, each tooth having a cutting edge extending radially through said web, each web being formed with a gullet extending upwardly from said cutting edge, each gullet having circumferentially spaced leading and trailing side walls and an upper end defined by a wall which inclines upwardly in a radially outward direction, said upper end wall comprising a radially inner section and a radially

outer section which intersect intermediate the radially inner and outer faces of said web, said outer wall section being inclined to the horizontal at an angle of between about 45 to 70° and said inner wall section being inclined to the horizontal at an angle not greater than about 40°, said line of intersection being spaced radially substantially closer to the radially inner face of said web than the outer face thereof.

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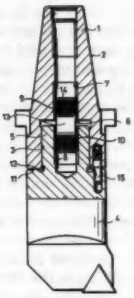
COUPLING ARRANGEMENT FOR MODULAR TOOL-SYSTEMS

Ferenc Dudás, and Iván Lévárdy, both of Budapest, Hungary, assignors to Forgacsoloszerszamipari Vallalat, Hungary

Filed Mar. 2, 1984, Ser. No. 585,889
Claims priority, application Hungary, Mar. 15, 1983, 875/83
Int. Cl.⁴ B23B *31/04*
U.S. Cl. 408—239 R **7 Claims**



1. Coupling arrangement for modular tool-systems for the engagement of a basic body clamped into the main spindle of machine-tools, where one of the engaged elements has a center bore, while the other one has a locating pin fitting into the bore, and wherein both elements are provided with a fixing or driving element, one of the elements has a threaded bore leading into the center bore and being coaxial therewith, and the other element is also provided with a threaded center bore, wherein the threaded bore of one of the elements is provided with a screw pitch direction identical with, but steeper than that of the other element, and a differential screw is screwed into these threads, said driving element is a driving pin, one half of said pin is fitted into a bore of one of the elements, said bore being arranged parallel and eccentrically in relation to the center bore, while the diameter of the other half is smaller and being arranged eccentrically in relation to the former half and has a conical end section and is fitted into the bore of the other element.

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DISTRIBUTOR DEVICE FOR DELIVERING COOLANT FROM THE OUTSIDE OF A MACHINE TOOL SPINDLE

Sergio Cioci, S. Martino Alla Palma, Italy, assignor to Baküer Italiana S.p.A., Italy

Filed May 17, 1984, Ser. No. 611,409
Claims priority, application Italy, May 24, 1983, 9438 A/83
Int. Cl.⁴ B23B *27/10, 51/06*
U.S. Cl. 409—136 **6 Claims**

1. An automatic machine tool with tool holder and distributor for cooling liquid comprising:

a machine structure (1);

a spindle (3) mounted for rotation on said structure about a central axis, said spindle forming a conical seat (5) for a conical shank;

a toolholder head (9) with a conical shank (7) for engagement in said conical seat of said spindle, said head having a collar with a notch (9C) for engagement with a portion of said spindle for fixing a rotational position between said head and said spindle;

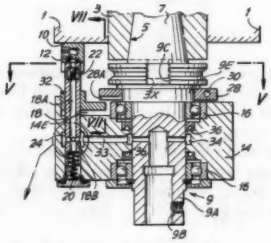
a distributor (14) mounted for free rotation on said head about said central axis with said conical shank (7) engaged in said conical seat (5), said distributor including a passage (33, 34) for coolant to an interior (9B) of said head (9);

a retractable piston (18) with an axial passage (18A) parallel to said central axis, mounted for sliding on said distributor in a direction parallel to said central axis and at a position radially spaced from said central axis with said conical shank (7) engaged with said conical seat (5), said retractible piston having an end with an opening communicating with said axial passage (18A) facing said machine structure (1);

biasing means in said distributor and engaged with said retractable piston (18) for biasing said retractible piston toward said machine structure (1);

said axial passage (18A) of said retractible piston communicating with said passage (33,34) of said distributor in at least one position of said retractible piston (18) with respect to said distributor (14);

a ring (28) connected to said head (9) and having a seat (28A) therein;



a catch (32) mounted on said retractible piston (18) at a location outside said distributor (14), said catch being shaped to engage in said seat (28A) of said ring (28) by the influence of said biasing means for fixing a rotational position between said distributor and said head when said piston is out of engagement with said plug, said catch being out of engagement with said seat (28A) when said piston is in engagement with said plug; and

a fork-shaped plug (10,12) fixed to said machine structure (1) radially spaced from said central axis and at a selected rotational position around said central axis, said retractible piston (18) being positioned at an equal radial distance from said central axis as said fork-shaped plug so that said end of said piston engages with said fork-shaped plug, said fork-shaped plug including an opening for coolant and for supplying coolant to said axial passage (18A) of said retractible piston (18) with said conical shank (7) engaged with said conical seat (5), said axial passage of said piston communicating with said passage of said distributor when said end of said piston is engaged with said fork-shaped plug.

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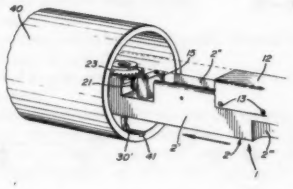
PORTABLE SLOTTING AND GROOVING ATTACHMENT

Vojislav Scepanovic, 2 Paytoix Ct., Brampton, Ontario L6W 3S7, and Réjean Raiche, 825 Saint-Pierre St., Chambly, Province of Quebec J3L 1M3, both of Canada

Filed Aug. 12, 1983, Ser. No. 522,615
Int. Cl.⁴ B23C *3/28*
U.S. Cl. 409—143 **2 Claims**

1. An attachment for a lathe or milling machine comprising: an elongated solid bar, with longitudinally-extending spaced parallel flanges, and a rear end portion of reduced thickness adapted to be detachably secured by the tool holder of the

carriage of said lathe or of the head portion of said milling machine; a driving motor secured to the rear end of said bar and having an output shaft; a longitudinally-extending drive shaft rotatably carried by said bar and having a rear end operatively connected to the said output shaft, and extending between said flanges; a first bevel gear rigidly secured to the forward end of said drive shaft; a second bevel gear operatively meshing with said first bevel gear; a drive spindle se-



cured to said second bevel gear and journaled in the forward end of said bar, said spindle being normal to said drive shaft and having an axial bore opening laterally out of said bar, said spindle bore having an internal threading constituting means to secure within said bore the engageable threaded shank of a rotary cutting tool, with the cutting portion of said tool projecting laterally of said bar; and a lock screw, also threadedly engaged in said internal threading, and rigidly abutting the end of said tool shank.

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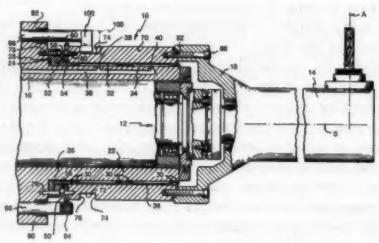
TOOLING ATTACHMENT ADAPTOR ASSEMBLY

George H. Marsland, Bristol, Conn., assignor to Colt Industries Operating Corporation, West Hartford, Conn.

Filed Feb. 27, 1984, Ser. No. 584,201
Int. Cl.⁴ B23C *5/26, 7/00*
U.S. Cl. 409—144 **16 Claims**



1. An adaptor assembly for a tooling attachment for a machine tool, the machine tool including a spindle housing which at least in part encloses a spindle which is rotatable about an axis, said spindle housing including a sleeve which is co-axial with the axis of rotation of the spindle, the tooling attachment including a housing and a drive mechanism adapted to engage the spindle, said adaptor assembly comprising:

an adaptor sleeve, said adaptor sleeve having first and second oppositely disposed ends, said adaptor sleeve having an internal diameter which is greater than the external diameter of the spindle housing sleeve whereby said adaptor sleeve may be positioned coaxially with respect to the spindle housing sleeve;

means for releasably affixing the first end of said adaptor sleeve to the housing of the tooling attachment;

radially expandable sleeve clamp means for releasably coupling said adaptor sleeve intermediate the ends thereof to the spindle housing, said sleeve clamp means being positioned between said adaptor sleeve and the spindle housing sleeve when said adaptor assembly is mounted on a machine tool;

coupling means for selectively rigidly coupling the second end of said adaptor sleeve to the spindle housing, said coupling means permitting variation of the rotational position of said adaptor sleeve relative to the spindle housing when both of said sleeve clamp means and coupling means are in the unactuated state; and

actuator means for causing engagement and disengagement of said coupling means.

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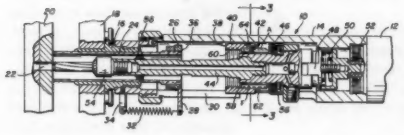
DWELL AND DEPTH ATTACHMENT

Paul A. Biek, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Sep. 19, 1983, Ser. No. 533,719
Int. Cl.⁴ B23C *9/00*; B23B *47/00*
U.S. Cl. 409—218 **6 Claims**



1. An improved dwell and depth attachment for power drills and the like wherein the drill includes an output shaft that is moveable longitudinally therein for rotating and feeding a drill bit and the like, the improvement comprising:

elongate hollow housing means having a free end and an end connected with the drill;

drive spindle means having one end connected with the output shaft, said spindle means extending through said housing and having a distal end arranged for connection to the drill bit;

an elongate sleeve projecting from the free end of said housing means and encircling said spindle means and having a first end for engaging a work piece that is to be drilled and having a second end;

adjustable depth control means located within said housing means, said control means encircling said spindle means and connected for movement with said spindle means, said control means including a first portion having an end engageable with the second end of said sleeve to limit the movement of said spindle means relative to said sleeve and work piece, said first portion being generally annular, having a threaded interior and having a plurality of circumferentially spaced, radially extending holes therethrough, said control means including a second portion having a threaded exterior mating with the threaded interior of said first portion and having ten slots substantially equally spaced about said exterior traversing said threaded exterior, and also including rotation preventing means located in one of said radially extending holes and engaging said second portion in one of said slots, said holes, except said first and last holes, being substantially equally spaced by a distance of about nine-tenths of the space between two of said slots; and

whereby one full rotation of said first portion relative to said second portion moves the end on said depth control means toward or away from the second end on said sleeve by a predetermined amount, whereby rotation by one slot moves said ends by one-tenth of the pre-determined amount and whereby movement of said rotation preventing means from one said hole to the next with positioning of said preventing means in the next slot moves said ends by one-one hundredth of the predetermined amount.

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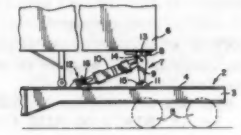
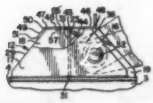
MULTIPLANAR SUPPORT BEAM FOR HITCH PIVOT MOUNT

Harold E. Hesch, St. John, Ind., and Phillip G. Przybylinski, Shererville, Ill., assignors to Pullman Standard Inc., Chicago, Ill.

Filed Aug. 3, 1983, Ser. No. 519,846
Int. Cl.[4] B60P 3/07
U.S. Cl. 410—58 6 Claims





1. A pivot mount for pivotally mounting an end portion of a fifth wheel support strut to a conveyance vehicle, said pivot mount comprising:

a base means;

a pair of end members rigidly affixed to said base means for transferring forces imposed on said pivot mount to said base means, said end members being substantially parallel to each and spaced from each other;

a pair of lug members rigidly affixed to said base means, said lug members being positioned between and substantially parallel to said end members, said lug members being spaced and receiving an end portion of said support strut therebetween for receiving loads therefrom;

a transverse reinforcement plate member rigidly affixed to each of said end members and each of said lug members and to said base means for connecting said members together and for transferring loads received by said lug members to said base means and said end members;

a multiplanar support member rigidly affixed to each of said end members and each of said lug members and said transverse reinforcement plate member to transfer loads received by said lug members to said end members and to substantially rigidify said base means, said end members and said lug members as a pivot mount assembly; and

the multiplanar support member including

a first planar portion rigidly affixed to each of said end members and each of said lug members and to said transverse reinforcement plate member.

said first planar portion having a rear end, and a second planar portion formed integral with the rear end of the first planar portion and projecting downward therefrom,

said first planar portion having a forward end and a third planar portion formed integral with the forward end of the first planar portion and projecting upward therefrom, whereby said multiplanar support member undergoes minimal strain responsive to shear loads received from said lug members and provides for maximum clearance for support strut cushioning movement.

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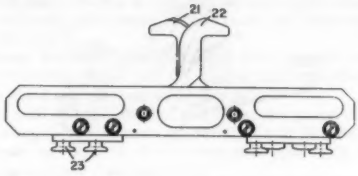
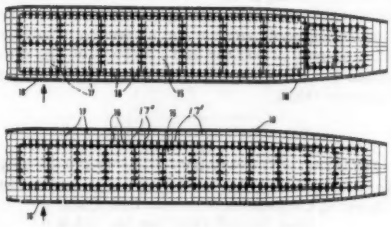
LATCHING CARGO IN AIRCRAFT

Eckhard Koch, Lilienthal; Günter Vogg, and Jochen Soller, both of Bremen, all of Fed. Rep. of Germany, assignors to Vereinigte Flugtechnische Werke GmbH, Bremen, Fed. Rep. of Germany

Filed Feb. 17, 1983, Ser. No. 467,344
Claims priority, application Fed. Rep. of Germany, Feb. 22, 1982, 3206384
Int. Cl.[4] B64C 1/20
U.S. Cl. 410—78 2 Claims





1. In an aircraft having a cargo space the floor of which is provided with roller or roller type track means constituting a conveyer system, the improvement comprising:

an array system of rails superimposed upon said conveyer system and being comprised of first rails extending longitudinally to the aircraft, and of second rails extending transverse to the first rails and in the same plane; and

a plurality of latch elements positionable in relation to and connectable to the first and second rails of said rail system and in variable positions thereto, the latch elements provided for sliding on the rails and being fastened thereto in selective positions, the latch elements constructed for engaging pieces of freight such as containers and pallets, for latching them into positions as predetermined by the positions of the rail elements.

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ANCHOR NUT FASTENER DEVICE

Harvey P. Jeal, Stevenage, England, assignor to Avdel Limited, Hertfordshire, England

Filed Aug. 8, 1983, Ser. No. 521,406
Claims priority, application United Kingdom, Aug. 6, 1982, 8222710; Apr. 7, 1983, 8309474
Int. Cl.[4] F16B 19/10
U.S. Cl. 411—40 6 Claims

1. An anchor nut fastener device comprising:

a hollow tubular body portion formed of a plastically deformable material and having:

(a) a longitudinal axis,

(b) an inner surface,

(c) an outer surface,

(d) a first longitudinal end,

(e) a second longitudinal end opposite said first end;

a flared portion integral with said first end of said body portion; and

a hollow tubular nut portion formed of said plastically deformable material and having:

(a) a longitudinal axis coaxial with said longitudinal axis of said body portion;

(b) an inner surface, a diameter of said nut portion inner surface being smaller than the diameter of said body portion inner surface,

(c) screw threads extending along the longitudinal length of said nut portion inner surface,

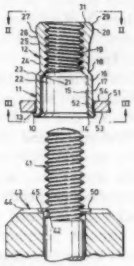
(d) an outer surface,

(e) a first longitudinal end integrally formed with said second end of said body portion,

(f) a second longitudinal end opposite said first end of said nut portion;

wherein said nut portion outer surface comprises:

(a) a relatively long portion extending from said first end of said nut portion towards said second end of said nut portion, a diameter of said long portion at said nut



portion first end being substantially equal to said body portion inner diameter, said relatively long portion tapering outward by a first angle such that a diameter thereof increases toward said second end of said nut portion,

(b) a relatively short portion extending from said relatively long portion to said second end of said nut portion, said relatively short portion tapering outward by a second angle, larger than said first angle, such that a diameter thereof increases toward said second end of said nut portion, wherein a wall thickness of said nut portion at said second end thereof is greater than a wall thickness of said body portion,

whereby initial movement of said nut portion in a longitudinal direction into said body portion causes a radial expansion of said body portion by coaction of said body portion with said relatively long portion, and whereby further movement of said nut portion into said body portion causes radial expansion of said body portion by coaction of said body portion with said relatively short portion.

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FASTENER RETENTION WITH IMPROVED FATIGUE LIFE

Jorge W. Molina, Torrance, Calif., assignor to Deutsch Fastener Corp., Lakewood, Calif.

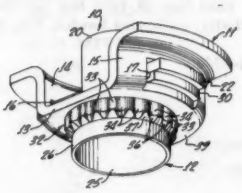
Filed Dec. 20, 1983, Ser. No. 563,591
Int. Cl.⁴ F16B *37/04*
U.S. Cl. 411—108 **11 Claims**

1. In combination with a fastener having a member engageable with one side of a workpiece adjacent one end of an opening through said workpiece, said member having an opening therethrough, and a sleeve extending through said opening in said member, said sleeve having a bendable outer end portion for being bent over the opposite side of the workpiece for forming a flange for holding said fastener to said workpiece, a fatigue resistant torque retention arrangement comprising

a plurality of axial lobes on said sleeve inwardly of said outer end portion of said sleeve,

said sleeve at the crests of said lobes having a greater outside diameter than at said outer end portion of said sleeve,

and an abutment surface at the inner end of the root of each of said lobes,



said abutment surface extending from adjacent the crests of said lobes to said root, and tapering inwardly toward said outer end position of said sleeve,

at least a portion of said abutment surface being within said opening in said member, whereby said abutment surface is spaced from the surface of a workpiece engaged by said member, yet can compress material of said workpiece displaced by said lobes upon entry of said lobes into said workpiece.

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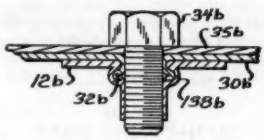
CLINCH NUT AND ASSEMBLY MACHINE

Francis C. Peterson, St. Charles, Ill., assignor to Illinois Tool Works, Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 118,300, Feb. 4, 1980, abandoned. This application Oct. 5, 1981, Ser. No. 308,209
Int. Cl.⁴ F16B *19/08*
U.S. Cl. 411—181 **9 Claims**



1. A clinch nut in combination with a sheet metal workpiece, said nut comprising a first portion including a flange engageable with a surface of said workpiece and having therein a first aperture of predetermined radial dimension and adapted to receive an extruded portion of a workpiece, a second tubular portion initially spaced from said first portion in a direction away from the workpiece and having a second aperture therein substantially aligned with said first aperture, said second aperture having a lateral dimension at least in part less than the thread crest diameter of a threaded screw or the like extending through the first aperture and spaced therefrom by said workpiece extruded portion, an integral interconnecting section between said first portion and said second portion, and said section having a laterally enlarged deformable area communicating with said first aperture in the direction of said second sheet metal portion for receipt of a laterally extended portion of said workpiece extruded portion in underlying relation to said first portion to retain a workpiece and said nut in assembled relation, said section being sufficiently axially collapsed and thereby forming a circumferential budge of said workpiece and first portion between said flange and said second portion, said section having a length generally at least as large as said predetermined radial dimension, inwardly extending projections disposed on and extending substantially fully along said

section in engagement with said extended portion of said workpiece.

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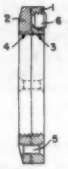
LOCKABLE NUT

Bengt Lundgren, Lerum, Sweden, assignor to SKF Nova AB, Goteborg, Sweden

Filed Nov. 25, 1983, Ser. No. 554,902
Claims priority, application Sweden, Feb. 2, 1983, 8300542
Int. Cl.⁴ F16B *39/28*
U.S. Cl. 411—230 **9 Claims**



1. A lock nut assembly adapted to be locked on a threaded element comprising at least a pair of coaxially oriented annular nut members having threads formed on their peripheral surfaces complementing and cooperable with the threaded element, resilient elastic means connecting said annular members and normally maintaining them in abutting relation at their axial end faces including at least one plug member made of rubber snugly engaging in axially aligned, circumferentially spaced openings in the nut members maintaining the nut members in side-by-side contacting array with a predetermined elastic prestress, said elastic resilient means permitting limited axial displacement of said annular members and restricting relative rotation thereof, and normally permitting free rotation of said annular members as a unit relative to the threaded element and screw actuator means for displacing said annular members axially relative to one another thereby to lock said annular members to the threaded element and wherein upon release of said actuator means said resilient elastic means urges said annular members to the axially abutting relation permitting rotation of said annular elements as a unit relative to the threaded element.

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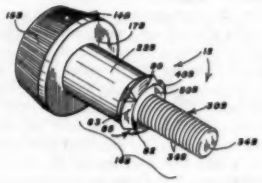
CAPTIVE PANEL SCREW

Royce W. Hill, Flippin, Ark., assignor to Micro Plastics, Inc., Flippin, Ark.

Continuation of Ser. No. 310,376, Oct. 13, 1981, Pat. No. 4,509,890. This application Aug. 16, 1984, Ser. No. 641,386
Int. Cl.⁴ F16B *39/00*
U.S. Cl. 411—337 **1 Claim**



1. A one-piece, flexible plastic captive panel screw adapted to be fitted through a first orifice in a first workpiece and to secure multiple workpieces in generally parallel alignment, the screw comprising:

a rigid head having a diameter substantially greater than the diameter of said first orifice, having a face adapted to firmly contact said first workpiece when said screw is properly installed, and having a predetermined thickness; and,

an integral shaft assembly for penetrating both said first orifice and a second orifice defined in a second workpiece and aligned with said first orifice whereby to maintain said first and second workpieces in generally parallel, spaced-apart relation, said shaft assembly projecting axially outwardly from the center of said head, and said shaft assembly comprising:

an axially aligned, cylindrical spacer section having a diameter less than the diameter of said head, said spacer section having a predetermined length substantially greater than the thickness of said head and terminating in an integral shoulder portion spaced-apart from said head, said shoulder portion firmly abutting said second workpiece when said screw is properly installed;

a relief section integrally defined in said spacer section and adjoining said spacer shoulder portion, said relief section being of circular cross section and having a diameter less than the diameter of said spacer section diameter, said relief section having a length substantially less than said length of said spacer section, and said relief section operable to secure and substantially captivate a second workpiece;

a flange section having an outer effective diameter greater than the diameter of said spacer section but smaller than the diameter of said head, the flange section being of generally frustro-conical dimensions and comprising four radially spaced-apart wedges facilitating snap fitting of said screw into said second workpiece, said wedges extending perpendicularly outwardly from the axis of said captive panel screw and being disposed about the circular periphery of the flange section at equal radially spaced-apart intervals and separated from one another by distinct voids, angularly inclined outer faces of each wedge tapering toward a reduced diameter portion of said flange section;

a terminal threaded section threadably adapted to penetrate, once said screw is properly installed, a third and other orifice within desired subsequent workpieces to be fastened and operable to receive a suitable bolt, said terminal section having a diameter smaller than said spacer section diameter and smaller than said diameter of said relief section, said threaded section having a length substantially greater than said length of said relief section, said threaded section adapted to secure subsequent apertured workpieces in generally parallel alignment to said first and second workpieces; and,

a second shoulder dividing said flange section from said terminal threaded section, said second shoulder being flat and circular and having a diameter substantially equal to the diameter of said relief section and being parallel with and spaced apart from said face of said head.

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COVER OF A NUT IN ENGAGEMENT WITH A BOLT

Makoto Masuda, Chigasaki; Hiroshi Iwasita, Misato, and Toshihiko Kuwabara, Itami, all of Japan, assignors to Fuji Seimitsu Mfg. Co., Ltd., Toyonaka, Japan

Continuation of Ser. No. 351,345, Feb. 23, 1982, abandoned, which is a continuation of Ser. No. 125,710, Feb. 28, 1980, abandoned. This application Aug. 7, 1984, Ser. No. 638,542
Claims priority, application Japan, Sep. 10, 1979, 54-124938[U]
Int. Cl.⁴ F16B *37/14*
U.S. Cl. 411—431 **3 Claims**

1. A cover for detachable fitting on a hexagon nut which is in engagement with a bolt to fasten a piece between the nut and bolt and has an outer periphery comprising vertical edges joined by planes, said cover comprising a resilient body comprising:

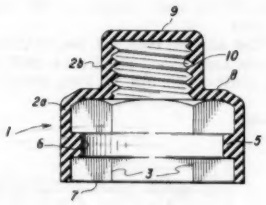
a tubiform basal portion having upper and lower ends and receiving the periphery of said hexagon nut;

a hollow swelled portion which extends integrally from the upper end of said basal portion and is closed at an end distal with respect to the basal portion, said basal portion and said hollow swelled portion being of substantially equal thickness and made from a material selected from the group consisting of polyvinyl chloride resin, polyethylene resin, polyurethane resin, fluoric resin and silicon rubber;

an inner periphery of said tubiform basal portion having a configuration corresponding to that of the outer periphery of the hexagon nut, and being shaped to be smaller than the outer periphery of the hexagon nut so as to tightly fit on the edges and on the planes located between the edges of the outer periphery of the hexagon nut, an inner periphery of said hollow swelled portion having a screw thread to be engaged with a screw thread formed on an end of a bolt extending out of the nut;

the hexagon nut being provided with recesses on the outer periphery at the middle position of the height of the nut, the recesses being formed at each of the edges of the nut;

extrusions corresponding to said recesses extending inwardly and integrally from the inner periphery of the basal portion so as to fit with the recesses, having upper and lower wall surfaces, each of the extrusions having a height which is greatest at the edges and zero at the middle positions between the edges;



the inner periphery of the wall of the basal portion being divided by said extrusions into an upper wall portion and a lower wall portion having substantially equal heights, the upper wall surface and bottom wall surface of the extrusions each extending along a line perpendicular to the axes of the bolt and nut, the bottom surfaces of said recesses being defined by a circle inscribed in said planes of the outer periphery of the hexagon nut so that the recesses have a depth which is greatest at the edges of the outer periphery of the nut and zero at the middle positions between two edges; the height of the lower wall portion of the basal portion being longer by a suitable value than the height of a lower portion of the nut defined by and between the bottom surface of the recesses and the bottom surface of the nut contacting with a piece fastened between the nut and a bolt engaged with the nut;

both the bottom surfaces of the recesses and the bottom surface of the nut being perpendicular to the axes of the bolt and nut, so that an end surface of the basal portion is pressed elastically against a surface of a fastened piece through engagement of the screw thread of the hollow swelled portion with the screw thread of the end of the bolt and of the extrusions of the cover with the recesses of the nut, whereby the basal portion is capable of easily being turned over to cover the nut and easily turned back to be detached from the nut.

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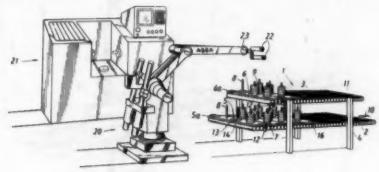
DELIVERY OF ARTICLES TO AND FROM A MECHANICAL TREATING MACHINE SERVED BY AN INDUSTRIAL ROBOT

Arne Berg, Västerås, Sweden, assignor to ASEA Aktiebolag, Västerås, Sweden

Filed May 4, 1983, Ser. No. 491,554
Claims priority, application Sweden, May 6, 1982, 8202833
Int. Cl.⁴ B65G *60/00*
U.S. Cl. 414—32 **9 Claims**



1. A method of supplying articles to, and transporting articles away from, an article-treatment machine, wherein the articles to be treated are:

supplied to the article-treatment machine on pallets on a first roller conveyor,

taken from a pallet and inserted into the article-treatment machine, and

placed on a pallet on a second roller conveyor; and

a pallet, when emptied of articles, is transferred from the first roller conveyor to the second roller conveyor by the robot serving the article-treatment machine.

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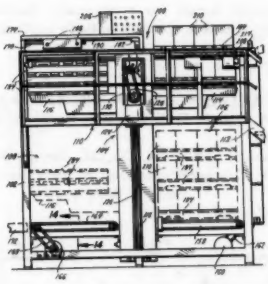
TOP FEEDING AND EJECTING MATERIALS HANDLING APPARATUS

Joseph F. Ouellette, 822 E. Essex, Glendale, Mo. 63122

Filed Oct. 11, 1978, Ser. No. 950,280
Int. Cl.⁴ B65G *57/03, 59/02*
U.S. Cl. 414—43 **8 Claims**



1. A materials handling device having a frame, means forming a bay in the frame for receiving pallets, the bay having conveying means cooperating therewith for transporting pallets into or out of the bay and an elevator for vertically transporting pallets in the bay, the device having a transversely movable plate means adjacent to the top of the bay for supporting a pallet in position at the top of the bay during a portion of continued operations when the elevator is sequenced down and for transversely transporting a pallet.

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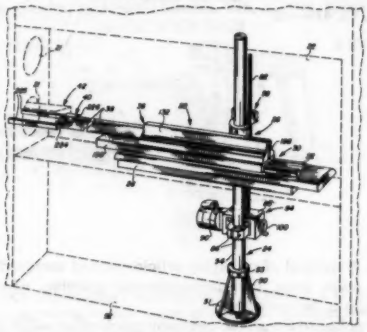
ARTICLE HANDLING APPARATUS AND METHOD

Donald M. Olson, Scottsdale; Norman L. Jackson, Chandler, and Jerry E. Tong, Tempe, all of Ariz., assignors to Advanced Semiconductor Materials America, Inc., Phoenix, Ariz.

Filed Oct. 5, 1983, Ser. No. 538,411
Int. Cl.[4] B65G *25/04, 49/00*
U.S. Cl. 414—180 73 Claims



1. An apparatus for handling various articles, comprising:

(a) a platform of elongated configuration disposed in a substantially horizontal plane;

(b) an article moving means for loading said articles mounted on said platform and reciprocally movable in a substantially horizontal plane between extended and retracted positions relative to said platform and reciprocally movable in a substantially vertical plane between elevated and retracted positions relative to said platform;

(c) an article carrier means for receiving and supporting said articles demountable mounted on said article moving means for movement therewith;

(d) a first means for reciprocally moving said article moving means in the substantially horizontal plane, said first means comprises a drive gear operably supported on said article moving means and operably engageable with a rack means coupled to said article moving means, a reversibly drivable motor mounted on said platform, and a drive shaft means located therebetween for operably coupling said drive gear and said reversibly drivable motor; and

(e) a second means for reciprocally moving said article moving means in the substantially vertical plane.

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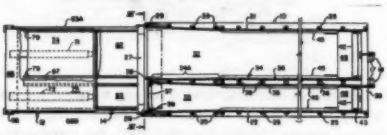
MATERIAL-HANDLING APPARATUS

Theodore A. Lutz, R.D. 1, Box 276, Rochester Rd., Sewickley, Pa. 15143

Continuation of Ser. No. 136,232, Apr. 1, 1980, Pat. No. 4,372,726. This application Jul. 29, 1982, Ser. No. 403,072
Int. Cl.[4] B65F *1/00*
U.S. Cl. 414—517 2 Claims



1. A material-handling apparatus including a container having upstanding side walls, a bottom wall and a roof wall adjoined along the side edges thereof, said container further having a front end wall means adjoined with one end of said walls and rear door means at the other ends of said walls, hinge means to support said rear door means on one of said walls, an internal partitive wall supported by said floor wall and roof wall between said side walls for subdividing the space enclosed by said walls into two longitudinal storage compartments, each at an opposite lateral side of the internal partitive wall, latch means to retain said rear door means in closed position against part of some of said walls to define two portal openings each communicating with one of said two storage compartments for separate passage of material into each of the compartments, a compartment door to form an enclosure for one of said two compartments, hinge means for swinging said compartment door between said partitive wall and one of said side walls, a pivot shaft supported by one of said side walls, a pivotal latch plate having an arcuate body section with a curved projecting end portion to move along a radial path about said pivot shaft, spaced-apart latch bars supported by said compartment door to receive the curved projecting end of a latch plate therebetween for preventing swinging of the compartment door about said hinge means, said curved projecting end portion of the pivot latch plate being movable into a locked position by partly wrapping around one of said latch bars to captively engage between said latch bars for load-bearing contact to effectively increase the rigidity of said partitive wall and said side walls, transfer means including two rams each communicating with one portal opening to separately advance material into said compartments under a compacting force, and means to support said transfer means for detachable connection with said container.

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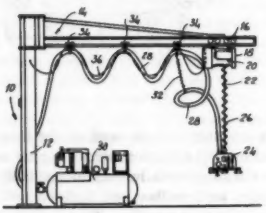
DEVICE FOR SUPPORTING AND HANDLING LOADS BY MEANS OF VACUUM OPERATED SUCTION PADS

Mario Scaglia, Milan, Italy, assignor to M. Scaglia S.p.A., Brembilla, Italy

Filed Aug. 30, 1983, Ser. No. 527,734
Claims priority, application Italy, Sep. 14, 1982, 22857/82[U]; Jan. 31, 1983, 20655/83[U]; Jan. 31, 1983, 20654/83[U]
Int. Cl.[4] B66C *1/02*
U.S. Cl. 414—627 13 Claims



1. In a lifting and/or transporting apparatus for lifting and controllably supporting a load by vacuum, said apparatus being of the type including a device supporting at least one suction pad adapted to sealingly contact a load to be lifted, means for connecting a source of vacuum to said suction pad to cause said suction pad to grip the load, means for lifting said device, and means mounted on said device for selectively releasing the vacuum in said suction pad and thereby releasing the load, the improvement wherein said device comprises:

means for measuring the vacuum in said suction pad;

means, operable in response to measurement by said measuring means, for controlling the operation of said lifting means;

a body connected to said lifting means and mounted to extend into said device for vertical movement relative thereto;

biasing means operable for urging said device in a first direction relative to said body into a first position in abutment therewith;

whereby, in the absence of a load and upon operation of said

lifting means, said biasing means urges said device into said first position, and upon the presence of a load and operation of said lifting means, said device moves by the weight of the load in a second direction opposite to said first direction and away from abutment with said body; and

said body including means for, upon said device being moved in said second direction, interrupting operation of said releasing means and thereby for preventing a lifted load from being released inadvertently, said interrupting means being inoperable when said device is in said first position in abutment with said body.

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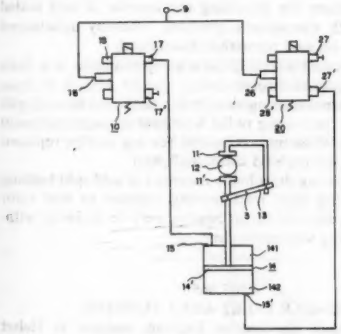
ROBOT HAND

Seiichiro Nakashima; Nobutoshi Torii, and Masayuki Hamura, all of Tokyo, Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

Filed Dec. 6, 1983, Ser. No. 558,474
Claims priority, application Japan, Dec. 6, 1982, 57-183727[U]
Int. Cl.⁴ B25J *15/02*
U.S. Cl. 414—730 **1 Claim**



1. A robot hand, comprising:

(a) a plurality of fingers;

(b) a double acting cylinder which drives said plurality of fingers;

(c) a first, 2-position, 5-port-type, single solenoid, electromagnetic valve, including—

(i) a first outlet which is connected with an inlet of the first valve in response to an ON position of the solenoid of the first valve and which is connected with an inlet of a first chamber of said double acting cylinder, the inlet of the first valve being connected with a working liquid pressure source, and

(ii) a second outlet which is connected with the inlet of the first valve in response to an OFF position of the solenoid and which is plugged; and

(d) a second, 2-position, 5-port-type, single solenoid, electromagnetic valve, including—

(i) a first outlet which is connected with an inlet of the second valve in response to an OFF position of the solenoid of the second valve and which is connected with an inlet of a second chamber of said double acting cylinder, the inlet of the second valve being connected with the working liquid pressure source, and

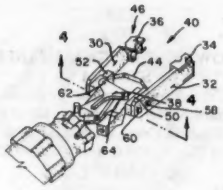
(ii) a second outlet which is connected with the first inlet of the second valve in response to an ON position of the solenoid of the second valve and which is plugged.

4,557,661

ROBOT SAFETY MECHANISM

Robert L. Fischer; Frank C. Pulcrano, both of Huntington; Lee C. Coldiron, Barboursville; Terry M. Topping, Huntington, all of W. Va.; J. H. Potter, Chesapeake, Ohio, and Robert H. Owens, Huntington, W. Va., assignors to ACF Industries, Incorporated, Earth City, Mo.

Filed Sep. 16, 1982, Ser. No. 418,931
Int. Cl.⁴ B25J *19/00*
U.S. Cl. 414—730 **2 Claims**



1. In a robot having a base portion and an outwardly extending boom pivotally mounted thereon; a pair of arms extending outwardly from said boom, the improvement comprising: shear pin means connecting said arm to said boom whereby impact of a predetermined force applied to said arms will shear said arms from said boom at a force sufficiently low to avoid significant damage to said boom; and switch means located between said arms effective to stop movement of said robot in the event of a longitudinally applied load between said arms, said switch means being in series with a relay and being in parallel with a reset button, said reset button being in series with at least one contact on said relay, and at least one normally closed contact on said relay being located in a series circuit which must carry current to allow movement of the robot.

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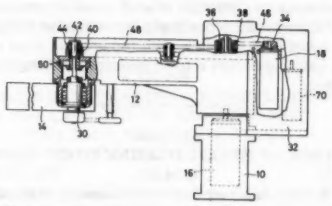
INDUSTRIAL ROBOT

Tsuneo Terauchi, and Yoshikazu Masuda, both of Aichi, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 23, 1983, Ser. No. 478,122
Claims priority, application Japan, Mar. 24, 1982, 57-46544
Int. Cl.⁴ B25J *3/00*
U.S. Cl. 414—744 R **5 Claims**



1. An industrial robot, comprising:

a stationary stand which supports a shaft;

a first arm rotatably mounted on said shaft;

motor receiving means fixedly secured to said stationary stand at the rear of said first arm;

speed reducing means mounted at the front end of said first arm;

a second arm secured to a second shaft coupled to the output side of said speed reducing means;

a second arm driving motor secured in said motor receiving

means and having an output shaft on which a first timing pulley is fixedly mounted;

a first arm driving motor built into said stationary stand;

a first timing belt laid over said first timing pulley and a second timing pulley which is coaxially mounted on the end of said shaft supported by said stationary stand; and

a second timing belt laid over said second timing pulley and a third timing pulley mounted on a third shaft coupled to the input side of said speed reducing means, said second timing belt being accommodated inside said first arm.

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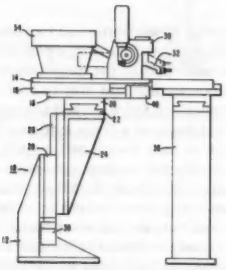
MODULAR, LOW COST, POGRAMMABLE ASSEMBLY SYSTEM

Tibor Csakvary, Pittsburgh; Lanson Y. Shum, Wexford Borough, and Bernard Miller, Pittsburgh, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 9, 1984, Ser. No. 569,076

Int. Cl.[4] B23Q *3/18*

U.S. Cl. 414—751 **2 Claims**



1. A programmable assembly system for performing any of a variety of operations for different batch assemblies wherein at least some of the different batches have different end points, comprising:

a relatively heavy machine base including one element shiftable in one direction in a horizontal plane, and including a table element supported by said one element and shiftable in another direction in a horizontal plane relative to said one element, said one and another directions being perpendicular to each other;

a non-servo robot fixedly mounted on said table element for performing the batch assembly operations; and

means for shifting said one element and said table element in the absence of operation of said robot to reposition said table element and accordingly reposition the end points of said robot in accordance with the product style of whatever batch operation is to be performed subsequent to the shifting.

4,557,664

CONTROL OF STEAM TURBINE SHAFT THRUST LOADS

Alan H. Tuttle, Andover; James K. Leonard, Wellsville; Shireesh A. Agharkar, Wellsville, and John Waggott, Wellsville, all of N.Y., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Apr. 13, 1983, Ser. No. 484,529

Int. Cl.[4] F01D *3/00, 25/16*

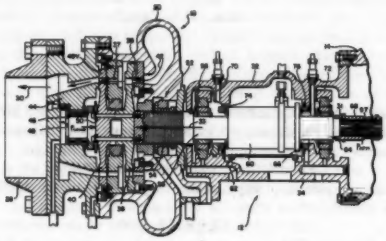
U.S. Cl. 415—105 **4 Claims**

1. In a single axial flow overhung steam turbine of the type having a high pressure input, a low pressure exhaust cavity, a rotor casing defining a steam passage from said input to said exhaust cavity, a rotor shaft supported for rotation within said casing and having a downstream end disposed in said exhaust cavity, a rotor mounted on said rotor shaft in flow communication with said steam passage from said input to said exhaust cavity for converting steam pressure into rotational force, an improved seal and bearing arrangement comprising:

(a) an exhaust diffuser mounted to said rotor casing within said exhaust cavity defining a pocket having an open end adjacent said downstream end of said rotor shaft and a closed end downstream from said open end;

(b) a first circular seal member sealingly mounted to the open end of said pocket;

(c) a second circular seal member sealingly mounted to the downstream end of said rotor shaft for sealing rotational engagement with said first circular seal member so that said pocket is sealed from said exhaust cavity;



(d) a duct means for providing the interior of said sealed pocket with atmospheric pressure, whereby unbalanced axial force on said rotor shaft is reduced;

(e) a split housing assembly detachably mounted in a fixed relationship to said rotor casing;

(f) a split journal bearing detachably mounted to said split housing for providing radial load bearing support to said rotor shaft, whereby said journal bearing may be replaced without removing said rotor shaft; and

(g) a thrust bearing detachably mounted to said split housing for providing axial load bearing support to said rotor shaft, whereby said thrust bearing may be replaced without removing said rotor shaft.

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VARIABLE INLET AREA TURBINE

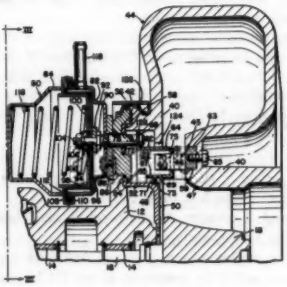
David T. Szczupak, Kirkheaton, England, assignor to Helset Engineering Company Limited, Huddersfield, England

Filed May 31, 1983, Ser. No. 499,734

Claims priority, application United Kingdom, May 28, 1982, 8215735

Int. Cl.[4] F01D *17/14;* F02B *37/12*

U.S. Cl. 415—158 **7 Claims**



1. A variable inlet area turbine comprising a turbine housing, a radial inward flow turbine wheel mounted for rotation in a chamber within the housing, said chamber having an annular inlet passage defined by a side wall and an opposed spaced

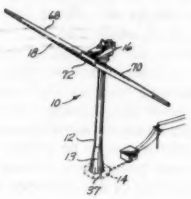
annular opening defined around its inner diameter by an annular wall arrangement through which a first side of a thin wall regulating ring pressing extends, said regulating ring pressing comprising inner and outer thin walled elongated tubular portions interconnected by a thin walled ring part and an integral radially outwardly directed thin wall flange connected to the outer tubular portion thereby permitting compliance of said regulating ring pressing, an opposite or second side of the ring arrangement being remote from said side wall, means including at least two actuating shafts connected to and acting on said integral outwardly directed thin wall flange for displacing the regulating ring means axially relatively to the side wall so as to vary the flow area of the inlet passage, and means forming a substantially fluid tight annular floating sealing ring received in an outwardly facing annular groove in said turbine housing annular wall arrangement and extending only between the inner turbular portion of said regulating ring and the turbine housing annular wall arrangement, said sealing ring having an outer circumferential surface in sliding contact with an inner surface of the inner tubular portion to obstruct flow of fluid to the chamber from the annular opening.

4,557,666

WIND TURBINE ROTOR

Joseph M. Baskin, Mercer Island; Gary E. Miller, Tukwila, and Wayne Wiesner, Kent, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Sep. 29, 1983, Ser. No. 537,749
Int. Cl.[4] F03D *7/04*
U.S. Cl. 416—32 **19 Claims**



1. A fixed pitch wind turbine rotor adapted to be mounted for rotation by the wind about a generally horizontal axis, comprising:

an elongated central hub portion with no twist having rounded edges and a substantially constant thickness between the edges;

a pair of fixed pitch blades, each blade extending radially outwardly from said hub in a direction diametrically opposite from the other blade;

each said blade having a mid-section of airfoil cross section positioned radially outwardly of said central hub portion, and a tip section of airfoil cross section positioned radially outwardly of the mid-section;

each said blade smoothly changing from the substantially constant thickness and rounded edge shape of the central hub portion into an airfoil cross section as it extends radially outwardly from the central hub portion;

each blade first changing to first a plus twist and then a zero twist and then a minus twist as it extends radially outwardly; and

each said blade tapering in thickness and chord as it extends radially outwardly from a location in its mid-section through its tip section.

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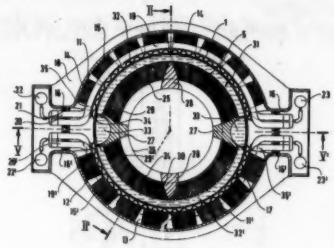
ELECTROMAGNETIC PUMP

Jean Delassus, Montmorency, and Lambert Pierrat, Grenoble, both of France, assignors to Electricite de France and CEM - Compagnie Electro-Mecanique, both of Paris, France

Filed Dec. 3, 1984, Ser. No. 677,410
Claims priority, application France, Dec. 1, 1983, 83 19209
Int. Cl.[4] H02K *44/02, 44/04*
U.S. Cl. 417—50 **6 Claims**



1. In an electromagnetic pump designed for electricity conducting fluid comprising an external pipe (1) around which a magnetic yoke (11, 11') is installed in the form of plates (12) containing slots (14) in which a polyphase winding (35, 35') is housed, consisting of induction coils (29) with the same axis as the external pipe (1) and an internal pipe (5) installed inside the external pipe (1) with the same axis as the latter and containing a magnetic core (24) inside, capable of creating with the polyphase winding (35, 35'), a magnetic field applying a force to the fluid in duct (31) between the two pipes (1, 5) to make it flow axially, the improvement wherein the internal tube (5) is blocked and in that coils (19, 19') are each installed in a slot (14) and each consist of a first half-coil (29) and a second half-coil (19') terminating by involutes (20, 20'), the first half-coils (19) being coupled together electrically by their involutes (20) to form the first half-winding (35), the second half-coils (19') being coupled together electrically by their involutes (20) to form a second half-winding (35'), the said first and second half-windings (35, 35'), forming the polyphase winding and being installed on either side of joint plane passing through the axis of pipes (1, 5) and being housed in the magnetic half-yokes (11, 11') grouped along the joint plane to form the magnetic yoke, and in that duct (31) contains means of separation (29, 29') installed in the vicinity of the parts of the external pipe (1) not enveloped by the half-coils (19, 19'), the said means of separation (29, 29') separating the duct into two active half-ducts (32, 32')and preventing the hydraulic circulation of the fluid outside the active half-ducts (32, 32') but permitting electrical conduction between the two active half-ducts (32, 32').

4,557,668

DOWN HOLE PUMP HAVING A GAS RELEASE VALVE

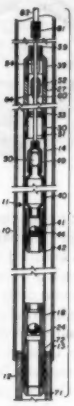
William A. Jones, P.O. Box 621, Lotus, Calif. 95651

Filed Jan. 9, 1985, Ser. No. 690,033
Int. Cl.[4] F04B *3/00, 21/06*
U.S. Cl. 417—259 **10 Claims**

1. In a downhole well pump having a fixed lower standing valve having an opening leading into a first open end thereof, a first valve seat in said valve having an opening normally closed by a valve element freely movable in said valve and of a diameter sufficient to normally close off the opening in said valve seat, said valve having a second open end with a reduced neck opening of a diameter less than the diameter of said valve element, said seat being disposed between said first and second open ends, a barrel fixed to said valve extending upwardly therefrom and in fluid communication with the interior of said valve, a traveling plunger disposed in said barrel and movable with respect thereto, said traveling plunger having one end coupled to a pull rod, a second valve having an opening therein

fixed to the other end of said plunger in fluid communication with the interior of said barrel, a second valve seat having an opening therein in said second valve and a second valve element of a diameter greater than said second valve seat opening in said second valve above said second valve opening, a throughbore receiving said pull rod therethrough and a cage having an opening therein at the upper end of said barrel communicating with the outside of said barrel, the upper end of said cage having a reduced neck portion, the improvement which comprises:

gas release means within said barrel above said second valve



and below said cage comprising a third valve seat mounted in said barrel having an opening therein, a third valve element slidably mounted on said pull rod above said third valve seat and below said cage having a diameter greater than the width of said valve seat opening and spaced from the walls of said barrel, and a trip fixedly mounted on said pull rod below said third valve seat of a diameter less than the diameter said said third valve seat opening and spaced from the walls of said barrel whereby said trip is adapted to pass upwardly through the opening in said third valve seat and lift said third valve element off of said third valve seat.

4,557,669

PUMPING APPARATUS

John A. Vanderjagt, 1395 Glen Oaks, Memphis, Tenn. 38117

Filed Sep. 4, 1984, Ser. No. 646,916

Int. Cl.[4] F04B *1/12, 27/03*

U.S. Cl. 417—271 **11 Claims**

1. A pumping apparatus for heavy viscous chemicals and the like comprising:

(a) a pump body, said pump body being provided with an inlet chamber and an outlet chamber separated from said inlet chamber;

(b) diaphragm means having first and second sides for coacting with said pump body to restrict the flow of chemicals to said second side;

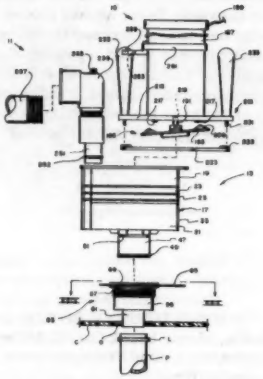
(c) a valve plate in said pump body on said second side of said diaphragm means provided with a plurality of inlet apertures and outlet apertures therethrough;

(d) means in said pump body on said second side of said diaphragm means for establishing partly with said valve plate a plurality of pump chambers respectively communicating with said inlet apertures and said outlet apertures;

(e) a plurality of spring actuated inlet valve means on said second side of said diaphragm means operating respectively in conjunction with said inlet apertures for the opening and closing thereof to govern flow from said inlet chamber to said pump chambers;

(f) a plurality of spring actuated outlet valve means on said second side of said diaphragm means operating respectively in conjunction with said outlet apertures for the opening and closing thereof to govern flow from said pump chambers to said outlet chamber;

(g) a plurality of piston means attached to said diaphragm means and operable respectively relative to said pump chambers movable between a raised position and a lowered position in said pump chambers, each of said piston means including spring means associated therewith for moving said piston means to said raised position;



(h) motor means including a rotatable shaft;

(i) non-rotatable swash plate means attached to said shaft and freely engaging said piston means for successively moving said piston means into said lowered positions and for subsequently allowing said piston means to successively move into said raised positions; and,

(j) means detachably coupling said motor means and said swash plate means to said pump body on said first side of said diaphragm means for allowing said swash plate means with said motor means to be quickly attached to or removed from said pump body without requiring any mechanical connection or disconnection between said swash plate means and said piston means.

4,557,670

COMPRESSOR

Mitsuo Inagaki; Seitoku Ito, both of Okazaki; Kenji Takeda, Aichi, and Yoshiki Kurokawa, Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio and Nippondenso Co. Ltd., Kariya, both of, Japan

Filed Mar. 7, 1983, Ser. No. 472,992

Claims priority, application Japan, Mar. 9, 1982, 57-35743

Int. Cl.[4] F04B *49/02*

U.S. Cl. 417—299 **11 Claims**

1. A compressor for use in a refrigerating apparatus comprising:

a housing having therein at least one movable compression chamber which has a volume varying in accordance with the movement thereof;

a suction passage arranged in said housing and connected to said compression chamber when said compression chamber is in a suction stroke, thereby to feed a refrigerant thereinto;

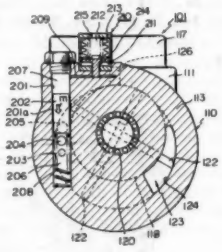
a discharge port arranged in said housing and connected to said compression chamber when said compression chamber is in a discharged stroke, thereby to discharge the refrigerant therefrom;

a discharge valve provided at the downstream end of said discharge port;

a bypass passage having an inlet portion and an outlet portion which is connected to said suction passage, said inlet portion having an opening which is able to be open to said compression chamber when said compression chamber is in a decreasing volume stroke, thereby to spill the refrigerant from the compression chamber into said suction passage;

valve means having a control pressure chamber formed in said housing and a valve member which is arranged in said inlet portion of said bypass passage and is actuated in response to a variety of pressures of the refrigerant in said control pressure chamber for adjusting the area of the opening of the inlet portion of said bypass passage;

pressure supply means arranged in said housing and connecting said control pressure chamber to said discharge port located upstream of said discharge valve for supplying a refrigerant which pressure is higher than the pressure in said suction passage when said compressor is operating and increasing the pressure in said control pressure chamber;



a spill passage arranged in said housing and interconnecting said control pressure chamber to said suction passage for spilling a part of the refrigerant in said control pressure chamber into said suction passage and decreasing the pressure in said control pressure chamber; and

pressure control means having a pressure control valve for controlling the amount of the refrigerant to be supplied into said control pressure chamber;

a pressure sensing means communicating with said suction passage for sensing variation in the pressure in said suction passage; and

an activator operatively connected to said pressure sensing means for activating said pressure control valve in response to certain variations in pressure sensed by said pressure sensing means so that said pressure sensing means is biased by suction pressure to activate said pressure control valve so as to supply the refrigerant into said control pressure chamber when said pressure sensing means senses that the pressure in said suction passage is higher than a predetermined pressure.

4,557,671

ARRANGEMENT OF CONNECTING A DIAPHRAGM WITH AN ACTUATOR ROD IN A DIAPHRAGM-OPERATED DEVICE

Kenichi Motoki, Hoya, and Nobuyasu Ushiroyama, Asaka, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

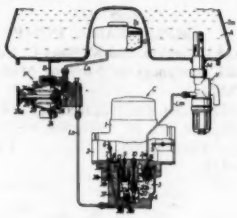
Continuation of Ser. No. 490,421, May 2, 1983, abandoned, which is a division of Ser. No. 261,484, May 7, 1981, Pat. No. 4,403,539. This application Oct. 16, 1984, Ser. No. 661,871

Claims priority, application Japan, Nov. 15, 1980, 55-163884

The portion of the term of this patent subsequent to Sep. 13, 2000, has been disclaimed.

Int. Cl.[4] F04B *19/00*

U.S. Cl. 417—328 **2 Claims**



1. A diaphragm-operated pump comprising a pump body; a diaphragm formed of elastic material and dividing the hollow interior of said pump body into a pump chamber having an inlet port and an outlet port and an atmospheric chamber, said diaphragm having a movable central portion with a connection boss formed thereon, said connection boss having a blind bore and an annular projection extending radially inwardly from the inner periphery of said blind bore; an actuator rod fitted in said blind bore for elastic engagement therewith having one end portion extending into said blind bore, said one end portion having an annular recess receiving the inwardly extending projection; a retainer fitted over the outer periphery of said connection boss for restraining deformation of said connection boss, said retainer including a cylinder portion fitted over the outer periphery of the connection boss for restraining radially expansive deformation of the boss and a flange portion integrally extending from the cylinder portion in a radially outward direction with its one side surface abutting against the diaphragm; and spring means for urging said retainer against said diaphragm, the other side surface of said flange portion supporting one end of said spring means.

4,557,672

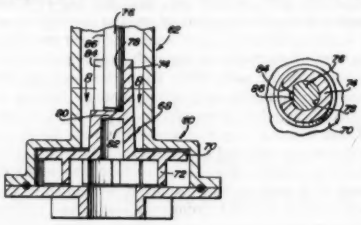
ICE MACHINE PUMP REBUILD KIT

Fred Levine, 1290 NW. 74th St., Miami, Fla. 33147

Filed Jan. 13, 1984, Ser. No. 570,451

Int. Cl.[4] F04B *17/00;* B63H *1/28;* B64C *27/32*

U.S. Cl. 417—360 **6 Claims**



1. An assembly for rebuilding an ice machine pump and

motor assembly which includes a motor, pump and pump housing comprising an impeller having an impeller head including a circular plate and projecting vanes received in the pump housing and a longitudinally extending shank having a longitudinal bore therein, and a motor having a drive shaft with a longitudinal flat surface thereon, said impeller shank bore having a flat surface internally thereof engaged with the flat surface on the drive shaft to prevent relative rotation therebetween, said shank of the impeller including a longitudinal slot extending outwardly from the inner end thereof, said shank being constructed of substantially rigid but yieldable plastic material with the bore being dimensioned to slip onto the shaft with the shank being sufficiently expandable to frictionally grip the shaft to securely mount the impeller on the shaft.

4,557,673

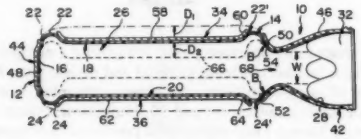
IMPLANTABLE PUMP

Herbert Chen, Kensington, and Michael G. Conley, El Cerrito, both of Calif., assignors to Novacor Medical Corporation, Oakland, Calif.

Continuation of Ser. No. 446,455, Dec. 3, 1982, abandoned. This application Oct. 17, 1984, Ser. No. 662,254

Int. Cl.[4] F04B *43/00;* **F01B** *19/00;* **F16J** *3/00*

U.S. Cl. 417—412 **3 Claims**



1. Chamber structure in a blood pump comprising a deformable seamless sac having a variable volume defined by an annular side wall and a pair of generally circular movable walls each joined to said side wall along opposite annular edges thereof through an outwardly convex flexible wall portion, said sac including inlet and outlet curved elongated ports each communicating with the sac and being defined by the inner surface of said side wall, said ports being disposed to direct inlet and outlet flow from said sac,

pusher means including a pair of opposed reciprocally acting pusher plates acting against said movable walls and being adapted for movement toward each other from an initial deflection position, at which said flexible wall portions each takes the form of a circumferentially uniform roll having an outwardly bulged cross-sectional curvature, toward an end-of-stroke position, said rolls each maintaining its circumferentially uniform bulge-like character throughout said movement,

a housing which includes a shell having inlet and outlet conduits surrounding said inlet and outlet ports and a rigid housing ring defining an annular wall surface exending around the outside of said side wall of said sac, said housing ring having elongated slots through which project said elongated ports of said sac, said housing ring and said pusher plates defining curved annular lip portions adapted to accommodate rolling of associated inner and outer edge regions, respectively, in said rolls as said pusher plates are moved toward each other from their initial deflection positions, said inlet and outlet conduits having curving surfaces extending from said curving annular lip portions of said housing ring, said curved annular lip portions of said housing ring and said pusher plates being curved and flared to present curved inner surfaces for rolling engagement with said sac, said sac being bonded to said annular wall surface of said housing ring and to said housing ring adjacent said elongated slots to hold said sac ports against change in cross section during the flexing of said sac,

said outer portions of said curved annular lip portions of said housing ring being unattached to said outwardly convex flexible wall portions of said sac to allow the latter to have a smooth rolling action without creasing along said outer portions during sac contraction and expansion,

said pusher plates having a selected total working stroke between the initial deflection position and the end-of-stroke position, and said pusher plate and said housing having a selected ring clearance, such that the interior surface of said sac remains essentially crease-free throughout the working stroke of the pump,

said rigid housing ring having sac-to-housing bond lines located such that the roll in said sac adjacent thereto is substantially tangential to said annular lip portions of said housing ring throughout movement of said pusher plates between said initial deflection position and said end-of-stroke position.

4,557,674

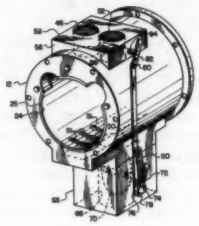
FLOW SENSING SPEED CONTROL FOR PRESSURE FLUID MOTOR

Robert D. Arnett, Jr., 4534 College Park, Dallas, Tex. 75229

Filed Jun. 30, 1983, Ser. No. 509,419

Int. Cl.[4] F01C *21/12*

U.S. Cl. 418—15 **7 Claims**



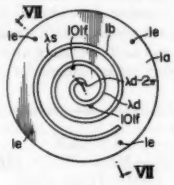
1. A pressure fluid operated motor including:

a housing defining fluid chamber means, rotor means rotatably disposed in said fluid chamber means, shaft means adapted to connect said rotor means to a driven load, a fluid inlet port for conducting pressure fluid at inlet pressure to said fluid chamber means, primary exhaust port means including primary exhaust fluid passage means for conducting exhaust fluid from said fluid chamber means, secondary exhaust port means including secondary exhaust fluid passage means for conducting exhaust fluid from said motor, fluid throttling means operable to throttle the flow of fluid through said motor to limit the speed of said rotor means, and flow sensing means associated with said secondary exhaust fluid passage means and operable to cause said throttling means to limit the flow of fluid through said motor in response to sensing an increasing flow of fluid through said secondary exhaust fluid passage means, said flow sensing means including vane means interposed in said secondary exhaust fluid passage means and operable to be moved by fluid flow through said secondary exhaust fluid passage means to effect operation of said throttling means to throttle fluid flow through said primary exhaust fluid passage means.

4,557,675
SCROLL-TYPE FLUID MACHINE WITH BACK PRESSURE CHAMBER BIASING AN ORBITING SCROLL MEMBER

Akira Murayama; Hiroaki Kuno; Naoshi Uchikawa; Takahiro Tamura; Takao Mizuno, all of Shimizu; Sumihisa Kotani, Ibaraki; Yoshikatsu Tomita, Shizuoka; Tetsuya Arata, Shimizu; Masao Shiibayashi, Shimizu, and Kazutaka Suefuji, Shimizu, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 18, 1984, Ser. No. 621,371
Claims priority, application Japan, Jun. 17, 1983, 58-107651
Int. Cl.⁴ F01C *1/04*
U.S. Cl. 418—55 **6 Claims**



1. A scroll-type fluid machine comprising:

an orbiting scroll member and a stationary scroll member each having an end plate and a spiral wrap protruding upright from one of the sides of said end plates, said orbiting scroll member and said stationary scroll member meshing with each other such that compression spaces of varying volume are defined by said end plates and said wraps of said orbiting and stationary scroll members, said orbiting scroll member being adapted to make an orbiting movement with respect to said stationary member so that said compression spaces are progressively moved radially inwardly while their volumes are decreased, said orbiting scroll member having a back pressure chamber formed on a backside thereof and communicating with said compression spaces of decreasing volume through pressure equalizing ports positioned at λ and $\lambda+2\pi$ formed in said orbiting scroll member, each of said wraps has at least two turns and the positions of said pressure equalizing ports in terms of the wrap angle λ of said wraps meet the following condition:

$$\lambda d > \lambda > \lambda d - 2\pi,$$

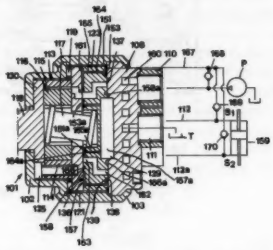
where, λd represents the wrap angle of said wraps when the volume of said compression spaces is minimized.

4,557,676
HYDROSTATIC CONTROL DEVICE, PARTICULARLY STEERING DEVICE

Hans C. Petersen, Nordborg; Erik Kyster, Augustenborg, and Svend E. Thomsen, Nordborg, all of Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Filed Nov. 10, 1983, Ser. No. 550,256
Claims priority, application Fed. Rep. of Germany, Nov. 24, 1982, 3243402
Int. Cl.⁴ F03C *2/08;* F16D *31/02*
U.S. Cl. 418—61 B **5 Claims**

1. A hydrostatic steering control device, comprising, a housing having a plurality of ports including fluid inlet and outlet ports and two motor ports connectable to an external servomotor, said housing having first and second transversely and oppositely facing annularly shaped wall means, a metering motor having a casing rotatably mounted in said housing, said casing having first and second wall means with first and second planar surfaces, said first planar surface being in sealing engagement with said housing first wall means, said metering motor being a gerotor type gear unit with an internally toothed ring member forming a part of said casing between said wall means thereof and an externally toothed star member engaging said ring member, said star member having orbital and rotational movement relative to said ring member to form expansible and collapsible chambers, said housing second wall means having valving orifices, directional valve means disposed between said second wall means of said casing and said housing, said directional valve means having first and second valving surfaces in respective valving engagement with said second wall means of said casing and said housing, said directional valve means having opposite turn functions formed by valving orifices therein and in said casing and housing second wall means, control shaft means for actuating said ring member to rotate said directional valve means upon said shaft means turning said ring and star members in unison, resilient means for maintaining said directional valve means in a neutral position between two operating positions in the absence of a turning force on said shaft means, passage means cooperable with and connecting said housing ports with said directional valve



means, said housing having exhaust passage means between said fluid outlet port and a space radially inward of said casing second wall means and said directional valve first valving surfaces, said housing second wall means and said directional valve second valving surface having first annular groove means therebetween, said casing second wall means and said directional valve first valving surface having second annular groove means therebetween, said casing and said housing having inlet and outlet passage means between said fluid inlet and outlet ports and said first and second groove means to provide high and low pressure zones respectively for said first and second groove means, first throttle gap means between said second housing wall means and said directional valve second valving surface downstream from said first groove means, and second throttle gap means between said second casing wall means and said directional valve first valving surface upstream from said second groove means to form an intermediate pressure zone between said first and second throttle gap means.

4,557,677
VALVELESS LUBRICANT PUMP FOR A LATERAL ROTARY COMPRESSOR

Masumi Hasegawa, Fuji, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 373,245, Apr. 29, 1982, abandoned.
This application Dec. 10, 1984, Ser. No. 679,940
Claims priority, application Japan, Apr. 30, 1981, 56-61501[U]
Int. Cl.⁴ F04C *18/00, 29/02;* F04B *39/02*
U.S. Cl. 418—63 **8 Claims**

1. A lateral rotary compressor comprising:

a casing having a lubricating oil reservoir for storing lubricating oil;

a rotary shaft disposed substantially horizontally in the casing;

bearing means for rotatably journaling the rotary shaft to the casing;

driving means provided at one end of the rotary shaft for rotating said shaft;

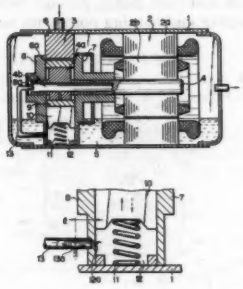
a compressing mechanism provided at the other end of the rotary shaft, said mechanism including

a blade chamber,

a blade disposed in the blade chamber and reciprocally moveable between at least a first position whereat the blade chamber volume is increased to a maximum volume and a second position whereat the blade chamber volume is decreased to a minimum volume, and

driving power transmitting means for reciprocally moving the blade in response to the rotation of the rotary shaft; and

a supply tube having first and second ends, said first end of said tube communicating with said blade chamber, said second end of said tube communicating with said bearing means, the supply tube including means for defning



an opening formed in a portion of said tube disposed within the lubricating oil reservoir, said opening having a diameter in the range of 1.5 mm to 3.5 mm,

said blade chamber not communicating with the lubricating oil reservoir except via the supply tube, whereby as the blade is moved from the second position to the first position, the lubricating oil in the supply tube and the lubricating oil in the reservoir in proximity with the opening formed in the supply tube are sucked into the blade chamber, and as the blade is moved from the first position to the second position, the lubricating oil in the blade chamber and the lubricating oil in the reservoir in proximity with the opening formed in the supply tube are delivered to said bearing means.

4,557,678

PUMP DEVICE

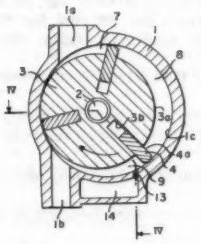
Shinji Nishimura, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 15, 1984, Ser. No. 610,433

Claims priority, application Japan, Jun. 21, 1983, 58-97331[U]

Int. Cl.[4] F04C *18/00*; F04B *11/00*

U.S. Cl. 418—180 **7 Claims**



1. A pump device, comprising in combination:

(a) a housing having an air intake port and an air discharge port, and with an inner peripheral surface of said housing being formed in a cylindrical shape;

(b) a rotor mounted in said housing and rotating eccentrically in said housing;

(c) a plurality of vanes mounted in said rotor and in sliding contact with the inner peripheral surface of said housing due to rotation of said rotor so as to deliver under pressure the gas from said air intake port to said air discharge port;

(d) an operating chamber defined by said vane, the inner peripheral surface of said housing, and the outer peripheral surface of said rotor;

(e) communicating port means communicatively connected with said operating chamber; and

(f) a gas storing chamber communicating with said operating chamber, said gas storing chamber communicating with said operating chamber through said communicating port means to reduce a pressure differential between said air discharge port and said operating chamber, said gas storing chamber being sealed except for said communicating port means.

4,557,679

ROTARY FLUID MACHINE WITH THRUST BEARING MOUNTING UNIT

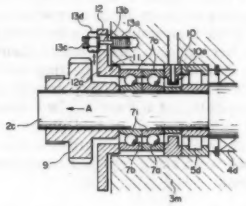
Hidetomo Mori; Osami Matsushita, both of Tomobe; Katsumi Matsubara, Usaiku; Michiaki Ida, Shimoinayoshi, and Shigeru Sasaki, Tomobe, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 30, 1984, Ser. No. 676,922

Claims priority, application Japan, Nov. 30, 1983, 58-224145

Int. Cl.[4] F04C *18/24*

U.S. Cl. 418—201 **17 Claims**



1. A rotary fluid machine comprising a casing means for defining a rotor-housing working space, a suction passage means and a discharge passage means communicating with said working space, a pair of rotors housed in said working space, each of said rotors having a toothed portion and shaft portion, roller radial bearing means provided between said shaft portions of said rotors and said casing means for rotatably supporting said rotors, roller thrust bearing means for rotatably supporting said shaft portions of said rotors, and a bearing support means provided between said roller thrust bearing means and said casing means, said bearing support means having an axial rigidity at least as high as an axial rigidity of said roller thrust bearing means and a radial rigidity of not more than one half that thereof.

4,557,680

APPARATUS FOR MAKING AN ENDLESS POWER TRANSMISSION BELT CONSTRUCTION

Paul M. Standley, Springfield, Mo., assignor to Dayco Corporation, Dayton, Ohio

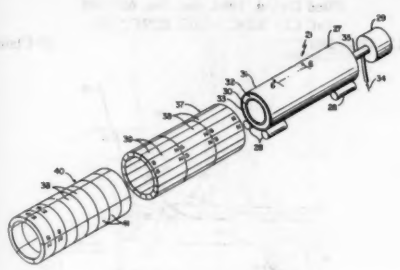
Division of Ser. No. 367,520, Apr. 12, 1982, Pat. No. 4,511,521. This application Dec. 18, 1984, Ser. No. 683,086

Int. Cl.[4] B29D *29/02*; B29H *7/22*

U.S. Cl. 425—3 **12 Claims**

1. In an apparatus for orienting materials in a substantially polymeric material, said apparatus having means for orienting

said material, the improvement wherein said apparatus comprises a centrifugal mold device comprising inner and outer cylinders defining a cylindrical chamber, and having support roller means and drive means operatively associated therewith,



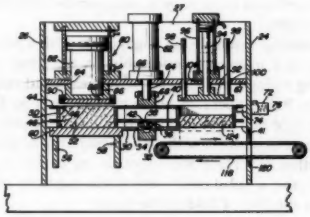
said centrifugal mold device supported for rotational movement on said roller means rotated by said drive means; and a cylindrical sleeve means formed from a plurality of field line generating means telescopically positionable over said centrifugal mold device.

4,557,681

APPARATUS FOR FORMING ADOBE BLOCKS

John W. Wright, Box 7395, Grants, N. Mex. 87020, and Jack L. Elkins, Grants, N. Mex., assignors to John W. Wright, Grants, N. Mex.

Filed Apr. 14, 1982, Ser. No. 368,443
Int. Cl.⁴ B28B *5/08*
U.S. Cl. 425—62 **5 Claims**



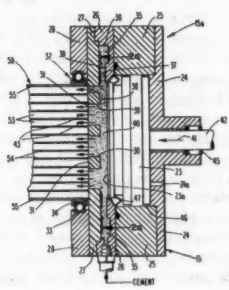
1. An apparatus for forming building blocks from freshly dug soil, said apparatus including a frame, a rotary table journaled from said frame for intermittent angular displacement about an upstanding axis and defining at least three peripherally spaced open-ended vertically extending sleeve-type cavities spaced equally radially outwardly from said axis, said frame defining first soil receiving, second pressure head and third ejection head stations spaced about said axis and with which said cavities are successively registrable, said soil receiving station being adapted to receive freshly dug soil and opening downwardly for discharging soil therefrom into cavities of said table successively registered therewith, said pressure head station including downwardly facing pressure head means displaceable downwardly into a cavity of said table for vertically compressing the soil therein and said ejection head station including a vertically shiftable ejection head for ejecting a compressed soil block from a cavity of said table registered therewith, said frame including a pair of long, parallel and edge upstanding horizontally elongated front and rear plate means, a pair of short, parallel and edge upstanding horizontally elongated side plate means extending and secured between corresponding ends of said long plate means, and long plate means defining horizontally elongated and registered openings extending therethrough centrally intermediate the upper and lower extremities of said long plate means, a horizontally elongated bracing bar extending and secured between said long plate means centrally intermediate the opposite ends thereof and at least generally horizontally registered with the lower marginal portions of said openings, combined thrust and journal bearing means supported from a mid-length portion of said bar and journaling said rotary table from said frame, diametrically opposite peripheral portions of said table projecting outwardly through said openings, said short plate means being disposed outwardly of diametrically opposite peripheral portions of said rotary table, the spacing between the remote sides of said long plate means being no more than twice the radial spacing of said cavities outward from the axis of rotation of said rotary table, horizontal plate means disposed at and extending along an arcuate path extending between said first and second stations and defining a bottom for said cavities disposed at and moving between said first and second stations, said second and third stations being disposed diametrically opposite each other relative to the axis of rotation of said table and between corresponding end portions of said long plate means, and first station being disposed outwardly of one of said long plates and generally equally angularly spaced between said second and third stations relative to the axis of rotation of said table, said second station including a pair of laterally spaced apart horizontal support plates extending and secured between said long plate means and spaced below said opening means, a horizontal backing plate overlying and supported from said support plates and including an upper surface substantially horizontally registered with said openings.

4,557,682

APPARATUS FOR FABRICATION OF SOLID PARTICULATE FILTERS

Max R. Montierth, Elmira, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Division of Ser. No. 350,996, Feb. 22, 1982, Pat. No. 4,428,758. This application Sep. 23, 1983, Ser. No. 535,241
Int. Cl.⁴ B29D *3/00*
U.S. Cl. 425—121 **1 Claim**



1. An apparatus for fabricating a solid particulate filter body from a honeycomb structure having a pair of opposing open end faces and a multiplicity of cells extending through the structure between the open end faces comprising:

a first mask having a first outer surface with a plurality of preformed openings extending through the mask and the first outer surface;

a second mask having a first outer surface and a plurality of preformed openings extending through the mask and said first outer surface;

the openings of said first and second masks being sufficiently sized and positioned to partially overlap one another when the first outer surfaces of the two masks are positioned in alignment opposing one another; and

frame means mounting the first and second masks with the first outer surfaces of the two masks in opposition for maintaining said first outer surfaces of said two masks in

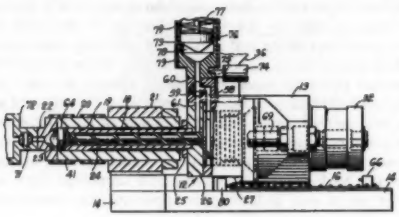
alignment with respect to one another against opposing end faces of the honeycomb structure.

4,557,683

ROTARY PLASTICATOR RAM INJECTION MACHINE

Gregory W. Meeker, Webster, and Norris E. Bleck, Rochester, both of N.Y., assignors to USM Corporation, Farmington, Conn.

Filed May 22, 1984, Ser. No. 612,678
Int. Cl.[4] B28B *13/00*
U.S. Cl. 425—147 8 Claims



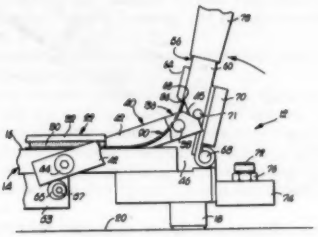
1. Apparatus for injection molding plastic articles including the combination of: a rotary processor for plasticating plastic and polymeric material comprising a rotor mounted for rotation in a housing, the rotor having a plurality of annular channels, which provide moving surfaces of a plurality of annular passages which are closed by a mating surface of the housing, the housing having an inlet through which material to be plasticated is fed into at least one of the passages, and fixed members projecting from the housing into the channels for restraining the material to be acted on by the moving surfaces and to direct the material to successive passages and toward an outlet, and motor means for rotating the rotor for plasticating and otherwise operating on the material fed through the inlet and successive passageways and through the outlet in substantially continuous fashion; an injection unit comprising a barrel, an injector ram reciprocable in the barrel in a first direction to enlarge a chamber at one end of the barrel to receive a predetermined charge of plasticated material and reciprocable in a second direction to force the charge from the chamber into a mold; an accumulator comprising a cylinder having a chamber adapted to receive plasticated material from the processor outlet and a piston in the cylinder biased toward a reduced volume condition in the accumulator chamber so as to receive material from the processor and to force material from the accumulator chamber into the barrel chamber; a valve interconnecting said rotary processor, said injection unit, and said accumulator, said valve in a first condition connecting the outlet of the processor and the accumulator chamber to the barrel chamber and in a second condition closing off the barrel chamber and connecting the outlet of the processor only to the accumulator chamber; and means effective when the barrel chamber has received a predetermined charge, for driving the injector ram in said other direction to force plasticated material from the barrel chamber into the mold whereby said valve in said first condition provides for flow of material to said barrel from both said processor and said accumulator during receiving of a charge of material in said barrel chamber, and said valve in said second condition provides for flow of material only to said accumulator during reciprocation of said ram to force the charge of material into a mold and thereby allow substantially continuous operation of said rotary processor during operation of the apparatus.

4,557,684

BENDER FOR SYNTHETIC RESIN PRINTING PLATES

Gary L. Romine; Woodrow W. Pendleton, and Daniel D. Dillinger, all of Emporia, Kans., assignors to Didde Graphic Systems Corporation, Emporia, Kans.

Filed Oct. 4, 1984, Ser. No. 657,608
Int. Cl.[4] B29C *17/02;* B29F *5/00*
U.S. Cl. 425—383 10 Claims



1. A bender for an edge segment of a resilient sheet of synthetic resin material having significant memory, said bender comprising:

a base having a flat surface for supporting a sheet;

crimping means swingably carried by the base and engageable with said edge segment of the sheet when the sheet is supported by the base;

positioning means carried by the base and engageable with the outer edge of said edge segment of the sheet for aligning said edge relative to the crimping means; and

clamping means connected to the base and engageable with the sheet for releasably fixing a portion of the sheet to the base with said outer edge in engagement with the positioning means;

said clamping means being engageable with a portion of the sheet in a manner to releasably fix the sheet to the base during swinging of the crimping means and said crimping means being operable while said sheet is so fixed to reverse fold said edge segment about an arc ending with said segment in contact with an adjacent area of the sheet and effective to crease the sheet to an extent sufficient to overcome a substantial part of the memory of the sheet along the line of fold of the same.

4,557,685

HEATED NOZZLE FOR INJECTION MOLDING APPARATUS

Jobst U. Gellert, 7A Prince St., Georgetown, Ontario, Canada L7G 2X1

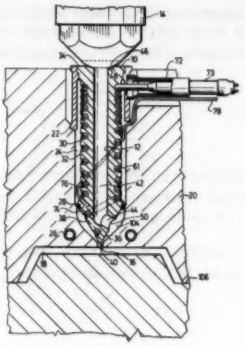
Filed Aug. 20, 1984, Ser. No. 642,340
Claims priority, application Canada, Jul. 13, 1984, 458899
Int. Cl.[4] B29F *1/03, 1/08*
U.S. Cl. 425—549 6 Claims

1. A heated nozzle for injection molding comprising:

(a) an elongated metal body having an inlet end, an outlet end, a melt bore extending longitudinally therethrough from a melt inlet at the inlet end to a melt outlet adjacent the outlet end, and a generally cylindrical outer surface with a generally spiral channel extending therein from a first end adjacent the inlet end of the body to a second end adjacent the outlet end of the body, and

(b) an electrically insulated heating element integrally embedded in the spiral channel by a highly conductive material bonded around the heating element, the heating element having a cold terminal extending from the first end of the channel whereby the controlled application of

electrical power to the terminal end of the heating element heats the body surrounding the melt channel to maintain



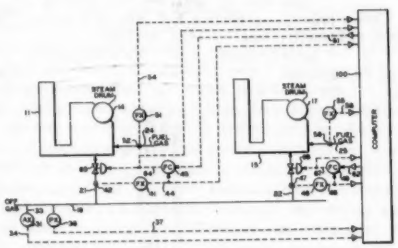
the melt flowing through the nozzle within a predetermined temperature range.

4,557,686

CONTROL OF THE FLOW OF FUEL TO MULTIPLE BURNERS

Ronald J. LaSpisa, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 16, 1984, Ser. No. 631,367
Int. Cl.[4] F23D *13/20*
U.S. Cl. 431—5 **10 Claims**



1. Apparatus comprising:
a first burner;
a second burner;
means for providing an offgas from an offgas source to said first burner;
means for providing said offgas from said offgas source to said second burner;
means for providing a first fuel gas to said first burner, wherein the combustion of said offgas and said first fuel gas at said first burner supplies heat to a first process with which said first burner is associated;
means for providing a second fuel gas to said second burner, wherein the combustion of said offgas and said second fuel gas at said second burner supplies heat to a second process with which said second burner is associated;
means for establishing a first signal representative of the actual pressure of said offgas source;
means for establishing a second signal representative of a minimum pressure for said offgas source;
means for comparing said first signal and said second signal and for establishing a third signal which is responsive to the difference between said first signal and said second signal, wherein said third signal is scaled so as to be representative of the total flow rate of offgas to said first burner and said second burner required to maintain the actual pressure of said offgas source substantially equal to the minimum pressure represented by said second signal;
means for establishing a fourth signal in response to said third signal, wherein said fourth signal is representative of the flow rate of offgas to said first burner which, in combination with the flow rate of offgas to said second burner, will maintain the actual pressure of said offgas source substantially equal to the minimum pressure represented by said second signal;
means for establishing a fifth signal in response to said third signal, wherein said fifth signal is representative of the flow rate of offgas to said second burner which, in combination with the flow rate of offgas to said first burner, will maintain the actual pressure of said offgas source substantially equal to the minimum pressure represented by said second signal;
means for establishing a sixth signal representative of the actual ratio of the heat supplied by the combustion of said offgas at said first burner to the total heat supplied by the combustion of said offgas and said first fuel gas at said first burner;
means for establishing a seventh signal representative of the desired ratio of the heat supplied by the combustion of said offgas at said first burner to the total heat supplied by the combustion of said offgas and said first fuel gas at said first burner;
means for comparing said sixth signal and said seventh signal and for establishing an eighth signal which is responsive to the difference between said sixth signal and said seventh signal, wherein said eighth signal is scaled so as to be representative of the flow rate of offgas to said first burner required to maintain the actual ratio represented by said sixth signal substantially equal to the desired ratio represented by said seventh signal;
a first low select;
means for providing said fourth signal and said eighth signal to said first low select, wherein a ninth signal which is representative of the one of said fourth and eighth signals which is representative of the lowest flow rate of offgas to said first burner is established as an output signal from said first low select;
means for manipulating the flow rate of offgas to said first burner in response to said ninth signal;
means for establishing a tenth signal representative of the actual ratio of the heat supplied by the combustion of said offgas at said second burner to the total heat supplied by the combustion of said offgas and said second fuel gas at said second burner;
means for establishing an eleventh signal representative of the desired ratio of the heat supplied by the combustion of said offgas at said second burner to the total heat supplied by the combustion of said offgas and said second fuel gas at said second burner;
means for comparing said tenth signal and said eleventh signal and for establishing a twelfth signal which is responsive to the difference between said tenth signal and said eleventh signal, wherein said twelfth signal is scaled so as to be representative of the flow rate of offgas to said second burner required to maintain the actual ratio represented by said tenth signal substantially equal to the desired ratio represented by said eleventh signal;
a second low select;
means for supplying said fifth signal and said twelfth signal to said second low select, wherein a thirteenth signal which is representative of the one of said fifth and twelfth signals which is representative of the lowest flow rate of offgas to said second burner is established as an output signal from said second low select; and
means for manipulating the flow rate of offgas to said second burner in response to said thirteenth signal.

4,557,687

FUEL ELEMENT AND FIREPLACE CONSTRUCTIONS USING SAME

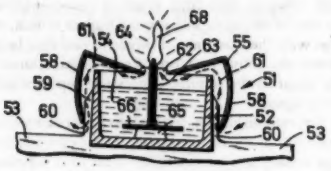
Hans-Ludwig Schirneker, Engelslit 10, D-4773 Möhnesee-Völlinghausen, Fed. Rep. of Germany

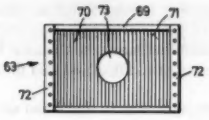
Filed Mar. 31, 1983, Ser. No. 480,668

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1982, 3211834

Int. Cl.[4] **F23D** *3/16*

U.S. Cl. 431—291 **7 Claims**





1. A fuel element for open burning facilities such as fireplaces, comprising:

(a) an elongated, box-like housing having bottom, side and end walls, and open at its top;

(b) a replenishable supply of solid fuel in said housing, said fuel being solid at normal temperatures and adapted to melt during use of the element;

(c) a removable cover positioned to close the top of the housing, said cover being formed with a longitudinally extending slot, and

(d) at least one wick means positioned in said housing and extending through said slot, said wick means comprising a core surrounded by corrugated metallic plates which function to dissipate the heat conducted therethrough when the core is burning, said core when ignited burning said fuel to form a flame above said cover in the vicinity of said slot, wherein said core has a metal plate arranged in it, which plate is formed with a generally central opening to facilitate movement of the fuel to the upper portion of the core during initial burning.

4,557,688

METHOD AND APPARATUS FOR CALCINING PULVERULENT RAW MATERIAL

Peter B. Nielsen, Copenhagen, Denmark, assignor to F. L. Smidth & Co. A/S, Denmark

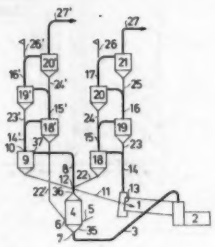
Filed Aug. 11, 1983, Ser. No. 522,395

Claims priority, application Denmark, Sep. 2, 1982, 3925/82

Int. Cl.[4] **F27B** *15/00, 7/02*

U.S. Cl. 432—14 **14 Claims**

1. In a method of calcining pulverulent raw material, wherein said raw material is suspended in a stream of oxygen-containing gas in a calcining zone, whereafter said suspension is withdrawn from said calcining zone, said calcined material is precipitated from said suspension in a precipitation zone, and gas and precipitated material are withdrawn from said precipitation zone as calciner exit gas and calcined product, respectively, the improvement comprising the steps of introducing said fuel, a stream of said oxygen-containing gas and a first stream of said pulverulent raw material into a high temperature part of said calcining zone; calcining said raw material from said first stream in said high temperature part of the zone in an overheated atmosphere at a temperature of 950°–1150° C. with a gas retention time in said high temperature part of the zone within the range of 0.5–5 seconds; and reducing the temperature of said calcined suspension exiting from said high tempera-



ture part of the zone in a following normal calcining temperature part of said calcining zone by 100°–300° to a level within the range of 800°–1000° C. by suspending a second stream of said pulverulent raw material into said suspension exiting from the high temperature part into the normal calcining temperature part and thereafter precipitating said calcined material in said precipitation zone.

4,557,689

TEXTURING MACHINE

Eberhard Krenzer, Ennepetal-Rüggeberg, Fed. Rep. of Germany, assignor to Barmag Barmer Maschinenfabrik Ag, Remscheid-Lennep, Fed. Rep. of Germany

Filed Jan. 23, 1981, Ser. No. 227,911

Claims priority, application Fed. Rep. of Germany, Jan. 26, 1980, 8002060[U]; Apr. 17, 1980, 3014748

Int. Cl.[4] **D02G** *1/16, 1/20;* **F27B** *9/28*

U.S. Cl. 432—59 **19 Claims**

1. In a heating tube for heat-setting a texturized yarn conducted in a linear path substantially along the tube axis, including means to heat said tube from its outer circumference, the improvement which comprises:

an elongted heating tube having a nominal inner diameter which is more than ten times the diameter of the texturized yarn and having a length of more than one meter, but containing a plurality of yarn encircling beaded segments with rounded inwardly protruding edges, at least one beaded segment being arranged in the entry section and in the exit section of the tube and a plurality of additional beaded segments being distributed along the length of the heated tube between the entry and exit sections, each of said beaded segments being formed by a smooth, ring-shaped deformation of the wall of the heating tube and

each of said beaded segments reducing the inner diameter of the heating tube by at least 5% up to about 50% of said nominal diameter while occupying not more than 1% of the total length of the heating tube, measured from its entry end to its exit end, and the total of all beaded segments occupying not more than 2.5% of said total length of the heating tube.

4,557,690

ACCESSORY FOR USE IN DENTISTRY

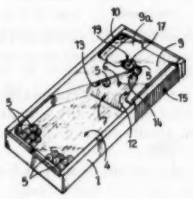
Jean-Claude Randin, Ballaigues, Switzerland, assignor to Les Fils d'Auguste Maillefer Societe Anonyme A. Ballaigues, Vaud, Switzerland

Filed May 18, 1984, Ser. No. 611,826

Claims priority, application Switzerland, Jun. 3, 1983, 3064/83

Int. Cl.³ A61C *19/00*

U.S. Cl. 433—49 **7 Claims**



1. An accessory for use in dentistry comprising, a body including a recess for storing a plurality of washers to be positioned on a reamer for indicating the working depth of such reamer, a distributor mounted on said body, said recess having oppositely disposed walls which coverage at a location proximate said distributor, a passageway formed in said body at a location spaced from said recess, said distributor having a notch opening formed along an edge thereof, the distributor being slidably movable between a first position in which said notch is positioned opposite said converging walls and a second position in which said notch is positioned opposite said passageway in the body, whereby a selected washer is movable from said recess to a location between said converging walls into the notch opening of the distributor and thereafter into registry with said passageway in the body upon movement of the distributor from said first position to said second position thereof to permit the washer to be engaged by said reamer upon positioning the reamer within the passgeway.

4,557,691

DENTAL PORCELAIN PASTE AND METHOD OF USING THE SAME

Brain Martin, Princeton Junction, and Carlino Panzera, Belle Mead, both of N.J., assignors to Johnson & Johnson Dental Products Company, East Windsor, N.J.

Continuation-in-part of Ser. No. 484,015, Apr. 11, 1983, abandoned. This application Aug. 20, 1984, Ser. No. 642,281

Int. Cl.⁴ A61K *6/08*

U.S. Cl. 433—199.1 **8 Claims**

1. A paste suitable for applying to a metal or ceramic dental base as a porcelain layer, which layer does not need to be fired prior to addition of a body porcelain layer, which paste comprises a porcelain powder and an aqueous colloidal dispersion of a urethane polymer, wherein said urethane polymer contains carboxyl groups, and wherein the carboxyl groups are neutralized with alkali metal, ammonia, or amine.

4,557,692

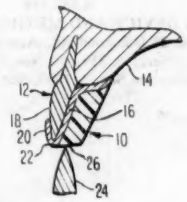
OCCLUSAL SPLINTS AND THE METHOD OF MANUFACTURING THE SAME

Peter M. Chorbajian, 10004 Carter Rd., Bethesda, Md. 20034

Continuation of Ser. No. 233,725, Feb. 12, 1981, abandoned. This application May 2, 1983, Ser. No. 489,602

Int. Cl.⁴ A61C *5/00*

U.S. Cl. 433—215 **3 Claims**



1. A method of making an occlusal splint having two layers of of resin material sized and shaped to be worn on the upper arch of the mouth over the teeth comprising the steps of molding an upper layer of resilient resin material to conform to the shape of the upper teeth and to be retained thereon, forming a lower layer of a cold-cure resin material which is built up on the upper layer, and shaping the lower surface of the lower layer so that the lower surface of the splint engages the upper surface of the lower teeth at a time when the condyls of the wearer are in their retruded rest position and said areas of engagement are all below the plane of the lowermost edges of said upper teeth.

4,557,693

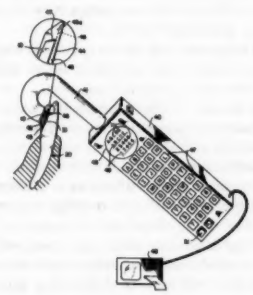
HUMAN IDENTIFICATION SYSTEM

Richard W. Elggren, Sandy, Utah, assignor to Exact-1-Dent, Incorporated, Sandy, Utah

Filed Nov. 18, 1983, Ser. No. 553,770

Int. Cl.⁴ A61C *5/00*

U.S. Cl. 433—229 **26 Claims**



1. A method for applying and retaining a data wafer to a living body wherein all phases of installation and detection of the carrier involve noninvasive techniques which are applied with respect to surface tooth structure of the body, said method being comprised of the steps of:

a. selecting a carrier material compatible with the oral environment and adapted for permanent positioning on a surface of the body's tooth structure;

b. preparing a thin wafer of a thickness less than 10 mils of said carrier material (i) to include a singularly unique identification configuration capable of detection as a unique identification for said body and (ii) to have dimensional properties which enable attachment of the wafer to a single tooth surface while preserving existing comfort

and space conditions in the mouth when in place, said identification configuration having information which is capable of being retrived by noninvasive means with respect to tooth structure; and

c. attaching the thin wafer at a surface of the single tooth without causing damage to tooth enamel or other permanent tooth structure.

4,557,694

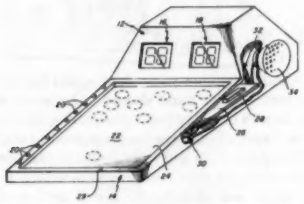
TEACHING DEVICE AND METHOD OF USING SAME

Roy A. Nelson, 25 Oakwood Rd., Acton, Mass. 01720

Continuation of Ser. No. 319,748, Nov. 9, 1981, abandoned. This application Sep. 1, 1983, Ser. No. 528,731

Int. Cl.⁴ G09B *7/06*

U.S. Cl. 434—339 **25 Claims**



1. A teaching device comprising:

a console comprising a keypad including switches arranged in a number of sets with each set including a plurality of switches and a data line;

processor means interconnected with the keypad for receiving manually entered signals from the data lines and preprogrammed with at least one algorithm,

overlay means adapted to cover said keypad so that said keypad switches are hidden and having indicia means descriptive of the game or teaching activity represented by the overlay means,

said overlay means comprising overlay programming means having visual indicia representative of predetermined instructional solutions for the temporary secretive programming of the processor means,

said overlay programming means indicia overlying switches of the keypad which are activated in an ordered sequence representative of a particular solution,

said overlay means further comprising overlay play means having visual selection notations each overlying switches of the keypad,

said processor means adapted to store said predetermined solution for comparison with the keys selected during operation in conjunction with said overlay play means,

at least some of the total number of switches, of the ordered sequence representative of a particular solution, being in different keypad locations than switches underlying the visual selection notations of the overlay play means.

4,557,695

NO-FEEDBACK STEERING SYSTEM FOR MARINE DRIVES

Gerald F. Neisen, Oshkosh, Wis., assignor to Brunswick Corp., Skokie, Ill.

Filed Dec. 29, 1982, Ser. No. 454,357

Int. Cl.⁴ B63H *21/26*

U.S. Cl. 440—53 **3 Claims**

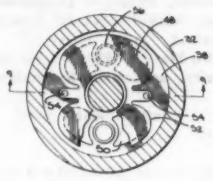
2. In a steering control for a steerable marine drive mounted on a boat and having a steering arm, said steering control having steering means movable by the operator of the boat, an improved steering system for limiting the application of forces on the marine drive to the steering means and for restraining the marine drive to a desired steering position, said steering system comprising:

a hydraulic cylinder anchored to one of said steering arm and said boat;

a piston axially movable in said cylinder and defining first and second chambers on first and second axially distal ends thereof within said cylinder, said piston having an axial communication passage therethrough providing communication of hydraulic fluid between said chambers;

a first axial shaft in said cylinder rigidly connecting said piston to the other of said steering arm and said boat;

valve means on said piston for closing said axial communication passage to lock said piston in place in said cylinder, and for opening said passage to permit axial movement of said piston; and



said operator steering means comprising a second axial shaft in said cylinder mechanically actuating said valve means from a point axially interior of said piston between said axially distal ends,

wherein said valve means comprises first and second valves at respective said first and second axially distal ends of said piston, and wherein each of said valves is normally closed against hydraulic pressure in its respective said chamber and is opened by hydraulic pressure in said axial communication passage from the other said chamber.

4,557,696

TILT MECHANISM FOR MARINE PROPULSION DEVICE

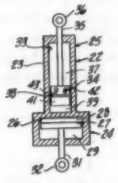
Ryoji Nakahama, Iwata, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Japan

Filed Dec. 27, 1983, Ser. No. 565,281

Claims priority, application Japan, Dec. 29, 1982, 57-230253

Int. Cl.⁴ B63H *5/12*

U.S. Cl. 440—61 **18 Claims**



1. In an outboard drive assembly comprising a first element adapted to be affixed to an associated watercraft, a second element carrying a propulsion device, means pivotally connecting said first and said second elements about a pivot axis that extends generally horizontally in use, the improvement comprising means for pivoting said second element relative to said first element comprising housing means defining a first fluid motor having a cylinder bore portion and means for selectively pressurizing said first cylinder bore portion and a second fluid motor having a cylinder bore portion fixed relative to said first cylinder bore portion and means for selectively pressurizing said second cylinder bore portion, a first piston slidably supported in said first cylinder bore portion, a first piston rod fixed for movement with said first piston, means for

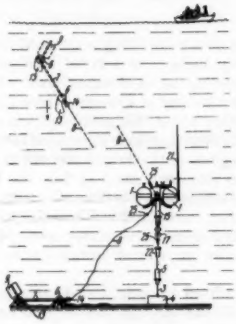
pivotally connecting said first piston rod to said first element, a second piston slidably supported in said second cylinder bore portion, a second piston rod fixed for movement with said second piston and means for pivotally connecting said second piston rod to said second element.

4,557,697

METHOD OF DELIVERING TO OCEAN BOTTOM AND RAISING TO SURFACE OF STATION FOR DEEP WATER RESEARCHES AND DESIGN OF STATION DELIVERED USING SAID METHOD

Evgeny A. Kontar; Sergei L. Soloviev; Viktor P. Brovko, all of Moscow; Rudolf G. Glukhikh, Liepaya; Evgeny N. Khomyakov, Liepaya; Jury F. Pakhomov, Liepaya; Alexei M. Khmeljuk, Moscow; Vladimir I. Vyalykh, Moscow; Leonid G. Zansokhov, Moscow; Valentin P. Smertin, Moscow; Alexei I. Evseev, Moscow, and Fyarit A. Sharipov, Liepaya, all of U.S.S.R., assignors to Institut Okeanologii Imeni P.P. Shirshova, U.S.S.R.

Filed Jul. 22, 1982, Ser. No. 400,901
Int. Cl.[4] B63B *21/52*
U.S. Cl. 441—2 **4 Claims**



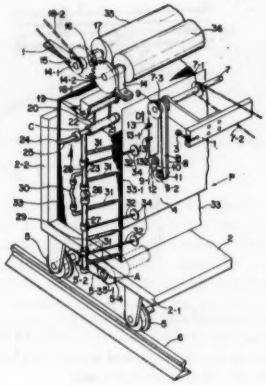
1. A station for deep-water research comprising
a float module;
a ballast weight;
a flexible link connecting said float module with said ballast weight;
a release for said flexible link;
a hydroacoustic channel to control said release;
at least one instrument package;
a cantilever rod on which said instrument package is secured, said cantilever rod being freely mounted on said float module for free movement away therefrom during submergence and upon application of hydrodynamic resistance to the movement of said rod;
an elastic rope connecting said cantilever rod with said float module; and
means disposed on said rod for creating a directed hydrodynamic resistance to the movement of said cantilever rod during submergence in a water mass,
said means providing the hydrodynamic resistance to be directed to cause separation and movement away from the path of said float module, and
wherein said means to create hydrodynamic resistance is disposed in the form of a cross-shaped stabilizer arranged on an end of said cantilever rod at an angle thereto.

4,557,698

APPARATUS FOR SUPPLYING CARDBOARDS

Hiroshi Nishida; Kouichi Hizawa, and Taiichi Mine, all of Hiratsuka, Japan, assignors to The Japan Tobacco & Salt Public Corporation, Tokyo, Japan

Filed Nov. 9, 1983, Ser. No. 550,094
Claims priority, application Japan, Nov. 10, 1982, 57-196032
Int. Cl.[4] B65H *3/22, 3/48*
U.S. Cl. 414—330 **13 Claims**



1. An apparatus for supplying cardboards comprising:
a frame;
support means for supporting a stack of cardboards and arranged on said frame for horizontal reciprocal movement;
a cardboard stack front position detecting means provided on said frame for detecting a position of the front of the cardboard stack on said cardboard stack support means;
cardboard stack support drive means for moving said cardboard stack support means to bring the front of the stack of cardboards on the cardboard stack support means to a reference position in response to a signal from said cardboard stack front position detecting means;
a pair of cardboard raising means mounted in said frame for contacting the front of the cardboard stack at said reference position;
a pair of rollers in said frame and above said cardboard stack raising means; and
a pair of compressed air jet means facing opposite sides of the stack of cardboards on said support means;
each pair including a pair of pivotally arranged bendable members depending from said frame on opposite sides of the stack of cardboards, cardboard posture follower rods projecting from said pivotally arranged bendable members for contacting the front surface of the stack on said support means, and compressed air jet nozzles projecting from said pivotally bendable members.

4,557,699

METHOD OF VERIFYING THE OPERABILITY OF SOCKETS IN A KINESCOPE AGING LINE

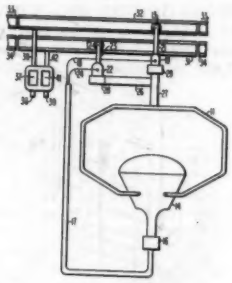
Henry E. Bolinsky, and Edward J. Klovensky, both of Lackawanna County, Pa., assignors to RCA Corporation, Princeton, N.J.

Filed Apr. 10, 1984, Ser. No. 598,731
Int. Cl.[4] H01J *9/42*
U.S. Cl. 445—3 **4 Claims**

1. A method of verifying the operability of the connecting sockets in a kinescope aging conveyor line wherein the kinescopes are moved along bus bars on carriers and the bus bars

apply operational voltages to the kinescopes through the sockets of the carriers comprising the steps of:

applying said operational voltages to special bus bar sections through individual ammeters, said special bus bar sections being sections along said bus bars but electrically isolated therefrom, each ammeter being associated with a pen plotter to plot current flow for each of said operational voltages;



individually identifying every carrier;

starting said pen plotters and recording the identification of the first carrier to reach said special bus bar sections after the start of said pen plotters; and

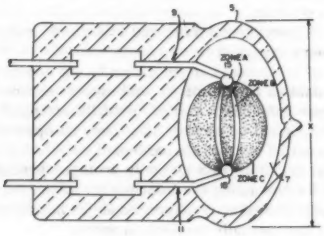
arranging said plotters such that the pen plots for each carrier are adjacent whereby the validity of each operational voltage is readily verified by visual inspection of the current plots.

4,557,700

METAL HALIDE DISCHARGE LAMP GAS FILL PROCESS TO PROVIDE MINIMAL COLOR SEPARATION

Harold L. Rothwell, Jr., Rowley, and George J. English, Reading, both of Mass., assignors to GTE Products Corporation, Stamford, Conn.

Filed Jun. 9, 1983, Ser. No. 502,776
Int. Cl.[4] H01J *9/395, 61/20*
U.S. Cl. 445—53 **7 Claims**



1. A process for effecting spectral uniformity of emitted light from a single-ended metal halide discharge lamp having a pair of electrodes with a spherical ball on the end of each one and spaced from one another along a longitudinal axis and sealed within an elliptical-shaped fused silica envelope having an inner wall comprising the steps of:

selecting a plurality of fill gases and additive gases each having different spectra of colors at differing spacial distributions of said discharge lamp;

selecting a plurality of overlapping zones extending outwardly from said core intermediate said pair of electrodes and choosing additive gases in a manner to provide emission of substantially white light from each of said plurality of overlapping zones; and

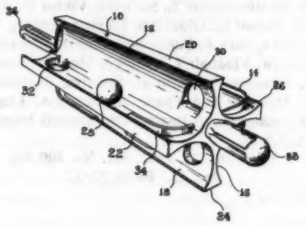
combining said selected additive gases in a manner to provide substantially white light emission at differing spacial distances from said core of said discharge lamp and integrating said white light emission at different spacial distances to provide emitted white light having minimal color separation from said discharge lamp.

4,557,701

TUMBLER TOY

John M. Giallombardo, 570 Pendale St., Staten Island, N.Y. 10306

Filed Feb. 22, 1984, Ser. No. 582,383
Int. Cl.[4] A63H *29/08*
U.S. Cl. 446—170 **4 Claims**



1. A tumbler toy, comprising in combination:

(a) four ramp surfaces in a radial configuration around a central core having an elongated axis, wherein said ramp surfaces are located at a ninety degree angle with respect to each other about said core, each curved wall section having an opening of such dimension as to allow a ball to pass through at only one end thereof, with the openings located so that each ramp surface has the openings at diametric opposing ends thereof, said openings being positioned on the curved wall sections so that each opening is spaced along its respective common axial line when the respective curved wall section is in an upward verticle position;

(b) a guide affixed to each of said ramp surfaces whereby said ball falling through any of said openings may be redirected in its path of travel so as to redirect any radial motion, which would tend to dislodge said ball from said tumbler toy, into an axial motion, thereby creating a possibility of manipulating the invention so as to cause said ball to fall through another said opening in another said ramp surface; and,

(c) means for rotating said multiplicity of ramp surfaces axially and radially.

4,557,702

DAMPER DISC ASSEMBLY FOR CLUTCH

Hiroshi Takeuchi, Osaka, Japan, assignor to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan

Filed Feb. 7, 1984, Ser. No. 577,825
Claims priority, application Japan, Feb. 9, 1983, 58-18451[U]
Int. Cl.[4] F16D *3/14*
U.S. Cl. 464—68 **5 Claims**

1. A damper disc assembly comprising:

a hub adapted to be connected to an output shaft, having a portion with a generally polygonal external shape and arcuate corners and including a flange-like projection having a circular outer peripheral surface;

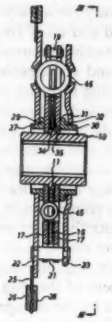
an annular sub-plate rotatably fitted to the outer periphery of the flange-like projection;

a pair of annular hub flanges having inner peripheries generally corresponding in shape to the generally polygonal external shape of the hub, one disposed at each side of the

sub-plate, the flanges being closely and unrotatably fitted to the generally polygonal external shape of the hub;

a pair of bushings rotatably mounted on the arcuate corners of the hub portion;

a pair of side plates having a torque input portion, disposed



at both sides of the flanges and unrotatably fixed to a corresponding one of the pair of bushings; and

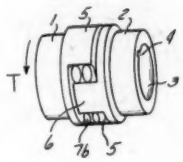
a spring means for transmitting the torque, disposed in openings in the flanges, the sub-plate and the side plates, and designed to change damping characteristics during a torsion operation of the disc.

4,557,703

ELASTOMERIC SPIDER COUPLING

Evgeny I. Rivin, 17641 Wiltshire Blvd., Lathrup Village, Mich. 48076

Filed Oct. 29, 1981, Ser. No. 316,436
Int. Cl.⁴ F16D *3/64*
U.S. Cl. 464—73 **4 Claims**



1. A shaft coupling for connecting the adjacent ends of two mechanical members, at least one of which is rotatably supported, comprising:

first and second hubs on said two mechanical members, respectively, said hubs having axially extending cams with opposed surfaces of said cams creating common openings for insertion of deformable members;

a spider-like coupling element having a central base and radially extending deformable legs which extend into said common openings to contact the opposed cam surfaces;

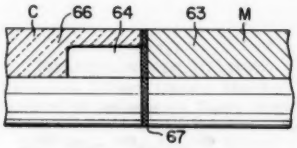
each of said deformable legs consisting of multiple cylinders, said cylinders having elliptical cross sections and said deformable legs accomodating torque between said two mechanical members by means of unrestrained compression deformation, said opposed surfaces and said deformable legs being shaped such that the contact area between said opposed surfaces and said deformable legs increases with increased torque transmission between said mechanical members.

4,557,704

JUNCTION STRUCTURE OF TURBINE SHAFT

Masaya Ito, Aichi; Seiji Mori, Konan, and Noboru Ishida, Kakamigahara, all of Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan

Filed Oct. 31, 1984, Ser. No. 666,913
Claims priority, application Japan, Nov. 8, 1983, 58-208344
Int. Cl.⁴ F16C *3/00*; F01D *25/00*
U.S. Cl. 464—181 **9 Claims**



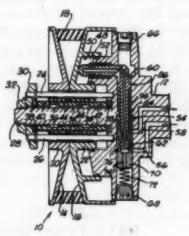
1. In a composite shaft comprised of a ceramic shaft and a metal shaft which is butt-joined to the end of the ceramic shaft, the ceramic shaft being on the side of a rotor to be operated at a higher temperature than the metal shaft, the improvement comprises a junction structure of the composite shaft wherein a void for heat insulation is provided only within the central portion of the abutting end of said ceramic shaft.

4,557,705

VARIABLE RATIO DRIVE

Yasuo Shimizu, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 491,977, May 5, 1983, abandoned. This application Feb. 20, 1985, Ser. No. 702,864
Claims priority, application Japan, May 27, 1982, 57-90382
Int. Cl.⁴ F16H *11/06*
U.S. Cl. 474—13 **16 Claims**



1. A variable ratio drive comprising

a variable diameter sheave;

a hydraulic drive coupled to said sheave to vary the diameter thereof;

input means mounted to rotate with said sheave for sensing sheave speed;

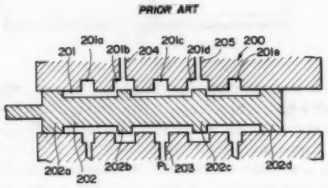
feedback means mounted to rotate with said sheave for sensing sheave diameter; and

a hydraulic control valve in communication with said hydraulic drive, said hydraulic control valve having a first valve element positionally responsive to said input means and a second valve element positionally response to said feedback means.

4,557,706
CONTROL SYSTEM FOR CONTINUOUSLY VARIABLE V-BELT TRANSMISSION

Yoshikazu Tanaka, Yokohama; Sigeaki Yamamuro, Zushi; Keiju Abo; Hiroyuki Hirano, both of Yokosuka; Haruyoshi Kumura, Yokohama, and Yoshiro Morimoto, Yokosuka, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Feb. 25, 1983, Ser. No. 469,764
Int. Cl.[4] F16H *11/04*
U.S. Cl. 474—28 **11 Claims**



1. A control system for a continuously variable V-belt transmission having a V-belt running over a drive pulley and a driven pulley, at least the drive pulley having a cylinder chamber, each of the drive and driven pulleys having two conical discs, one conical disc of the drive pulley being secured to a drive shaft, one conical disc of the driven pulley being secured to a driven shaft, the other conical disc of the drive pulley being controllably movable in an axial direction of the drive shaft in response to an oil pressure in the cylinder chamber thereof, the other conical disc of the driven pulley being controllably movable in an axial direction of the driven shaft, the control system comprising:

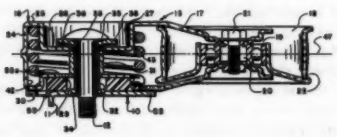
means for determining the oil pressure in the cylinder chamber of the drive pulley by regulating the flow of oil supplied to and the flow of oil discharged from the cylinder chamber of the drive pulley, said oil pressure determining means defining an oil discharge passage from the cylinder chamber of the drive pulley, said oil discharge passage allowing all of the flow of oil discharged from the cylinder chamber of the drive pulley to pass therethrough; and

flow restrictor means for restricting the size of said oil discharge passage so as to always restrict the flow of oil discharged from the cylinder chamber of the drive pulley.

4,557,707
BELT TENSIONER

Henry W. Thomey, Windsor, Canada, assignor to Dyneer Corporation, Westport, Conn.

Filed Apr. 9, 1984, Ser. No. 598,043
Int. Cl.[4] F16H *7/08*
U.S. Cl. 474—101 **15 Claims**



1. A belt tensioner construction for automatically tensioning an endless drive belt of a drive system for vehicle accessories, said tensioner construction including:

(a) a bracket having a camming surface adapted to be mounted on a vehicle engine adjacent the drive belt;

(b) a shaft mounted on the bracket;

(c) lever means pivotally mounted on the shaft and extending generally radially outwardly from the shaft for pivotal movement toward and away from the drive belt;

(d) pulley means rotatably mounted on an extended end of the lever means and engageable with the drive belt for applying a tensioning force on said belt when the lever is biased in a belt tensioning direction toward the drive belt;

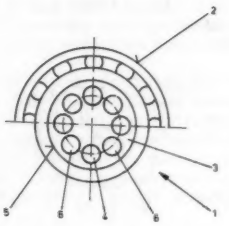
(e) a generally annular-shaped brake band ring located between the bracket and lever means and formed with a camming surface complementary to and engageable with the camming surface of the bracket; and

(f) coil spring means telescopically mounted about the shaft and engageable with the lever means and brake band ring for biasing the lever means in the belt tensioning direction and for biasing the ring into engagement with the lever means by movement of the ring along the camming surface of the bracket by the engagement of the complementary camming surfaces of the bracket and brake band ring to retard movement of the lever means in a direction opposite to the belt tensioning direction.

4,557,708
TENSION ROLLER

Manfred Brandenstein, Eussenheim; Roland Haas, Hofheim; Gerhard Herrmann, Schweinfurt, and Rüdiger Hans, Niederwerrn, all of Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Jun. 1, 1984, Ser. No. 616,020
Claims priority, application Fed. Rep. of Germany, Jun. 22, 1983, 8318103[U]
Int. Cl.[4] F16H *7/10*
U.S. Cl. 474—112 **3 Claims**



1. In a tension roller comprising a solid support body with an axially extending mounting bore eccentrically arranged therein, a seating surface formed circumferentially thereon, and a bearing press fit on said seating surface; the improvement comprising a plurality of balance bores circumferentially distributed in said support body, said balance bores extending axially for a length equal to at least the width of said seating surface.

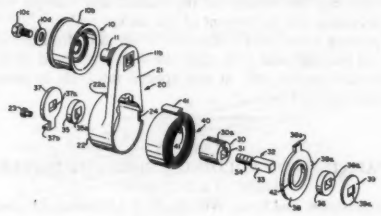
4,557,709
BELT TENSIONER SYSTEM

Richard C. St. John, North Canton, Ohio, assignor to I Corp., Akron, Ohio

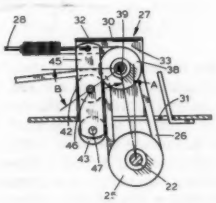
Filed May 3, 1982, Ser. No. 374,020
Int. Cl.[4] F16H *7/12*
U.S. Cl. 474—117 **17 Claims**

1. A belt tensioner for constantly, automatically maintaining substantially constant tension in the endless belt of a serpentine belt drive system, comprising:

(A) an idler pulley sheave adapted to engage the belt;
(B) a tensioner including
(1) a unitary hollow housing and
(2) an elongate arm extending from said housing and interconnecting said housing and said idler pulley sheave;
(C) said housing having a housing body and carrying an arbor adapted to be fixed to a supporting surface for rotatably supporting said housing body relative to the supporting surface;
(D) at least one optimum rate power spring having its opposed ends in engagement with said arbor and said housing respectively
(1) whereby forces from said belt applied to said idler pulley are constantly resisted by the frictional engagement of the coils of said spring and constant static tension is maintained in said belt drive system.

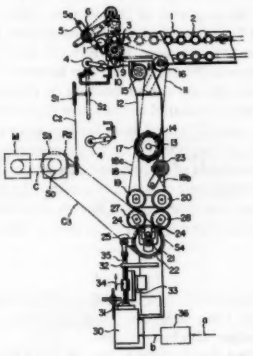


4,557,710
CLUTCH CONTROLLED DRIVE UNIT
C. Austin Greider, 3923 E. 28th St., Des Moines, Iowa 50317
Filed Feb. 27, 1984, Ser. No. 584,234
Int. Cl.[4] F16H *7/14*
U.S. Cl. 474—118 **9 Claims**



1. A drive unit actuable from an idle condition to an operating condition for transmitting drive power from a drive pulley to a driven pulley remote from said drive pulley, said unit comprising:
(a) said drive pulley is fixed on a drive shaft rotated by a power source;
(b) a directional pulley rotatably mounted generally above and in a spaced apart relation to said driven pulley;
(c) a directional roller rotatably mounted in a position adjacent said directional pulley;
(d) a continuous drive belt trained over an upper portion of said directional pulley, a lower portion of said driven pulley and then an upper portion of said directional roller;
(e) at least one lever arm having an axis of rotation coaxial with that of said directional roller and extending generally parallel to the portion of the drive belt running between said driven pulley and said directional roller;
(f) an idler roller rotatably mounted on said lever arm in a position adjacent said drive belt when said unit is in an idle condition; and
(g) means for exerting a pivoting force on said lever arm to move said idler roller into bearing engagement with said drive belt to take up slack in said drive belt and increase the amount of the driven pulley about which the drive belt is trained to thereby place the drive unit in an operating condition.

4,557,711
PHASE CONTROL DEVICE
Yoshihiro Yamanashi; Minoru Okuma; Masahito Hata, and Toshio Nishihara, all of Kanagawa, Japan, assignors to Toyo Shokuhin Kikai Kabushiki Kaisha, Yakohama, Japan
Filed Sep. 7, 1983, Ser. No. 529,941
Claims priority, application Japan, Sep. 30, 1982, 57-172869
Int. Cl.[4] B62D *1/00*
U.S. Cl. 474—900 **3 Claims**



1. A phase control system comprising;
a first conveyor for conveying articles;
as second conveyor receiving articles from said first conveyor;
drive means for simultaneously driving said first and second conveyor means;
a driven sprocket wheel for driving said first conveyor;
a driving sprocket wheel linked to said drive means;
an endless loop chain having an advancing portion and return portion connecting said driven wheel and said driving wheel;
at least one pair of movable wheels engaging said advancing portion and said returning portion traverse to the direction of movement of said endless loop chain between said driven wheel and said driving wheel;
adjusting means for adjusting said pair of movable wheels traverse to direction of movement of said endless loop chain to tighten the advancing portion while loosening the returning portion or vice versa;
said adjusting means comprising a movably mounted support supporting said movable wheel; an arm attached to said support for moving said support toward either the advancing portion or returning portion of said endless loop chain; a stepping motor linked to said arm to incrementally move said support toward either the advancing portion or returning portion of said endless loop chain in response to a speed signal representing a change in speed of said conveyors thereby automatically maintaining the respective phase relationship of said first and second conveyors.

4,557,712

APPARATUS FOR LAYING TUBE OR WEB SECTIONS INTO A FOLDED Z-SHAPED FORM

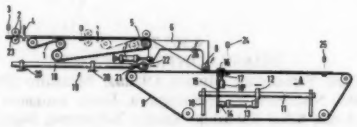
Werner Decker, Ladbergen, Fed. Rep. of Germany, assignor to Windmoller & Holscher, Lengerich, Fed. Rep. of Germany

Filed Dec. 27, 1982, Ser. No. 452,951

Claims priority, application Fed. Rep. of Germany, Dec. 28, 1981, 3151568

Int. Cl.⁴ B65H *29/46*

U.S. Cl. 493—11 **10 Claims**



1. Apparatus for laying tube or web sections into a folded Z-shaped form, comprising conveyor means for supplying the sections, characterised in that below the supplying conveyor means (1) there are means (9) for supporting or transporting the advanced leading end of the section (26), that clamping means (16, 17) for laterally clamping the section (26) tight on a transverse line are provided laterally of said supporting or transporting means (9), that in the gap between the supplying conveyor means (1) and the supporting or transporting means (9) and substantially parallel to the latter there is a reciprocatable transverse rod (22), and that further conveyor means at right-angles to the supporting or transporting means (9) have an inlet which consists of double belt conveyors (30) or pairs or rollers, is extensible and closable in a plier-like manner, and is arranged so that one side edge of the section (26) folded to Z shape by the transverse rod (22) lies within same.

4,557,713

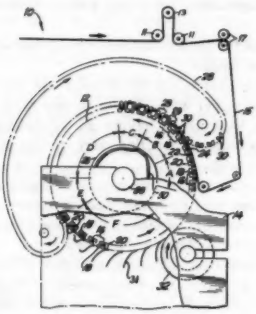
BAG MAKING MACHINE AND METHOD

Peter P. Savich, Long Meadow, Mass., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Jan. 16, 1984, Ser. No. 571,067

Int. Cl.⁴ B31B *1/64*

U.S. Cl. 493—194 **16 Claims**



12. Method of making bags from a continuously supplied folded web of thermoplastic material, comprising the steps of:

a. feeding a continuous supply of folded web onto the periphery of a continuously rotating drum at a linear speed of the web which is greater than the peripheral speed of the drum;

b. pressing said web towards said drum periphery at spaced intervals;

c. engaging a radially movable tucker roll against the web for tucking the web with respect to the periphery of the drum at locations between said spaced intervals as the drum rotates through a tucking zone of a defined arc length;

d. providing a sufficient number and depth of tucks so as to utilize a total length of web material sufficient to compensate for the difference between the web speed and the peripheral speed of the drum and while tucking, maintaining constant the tension on said web in said tucking zone;

e. clamping the tucked web at spaced intervals to the periphery of the drum at the end of said tucking zone;

f. relieving the tension on the tucked and clampd web by reversing the movement of the tucker roll;

g. passing a hot wire outwardly from said drum periphery and through said web, after the web is relieved of tension by said tucker roll, at said spaced intervals to sever the seal and said web.

4,557,714

APPARATUS FOR FOLDING A SHEET OF MATERIAL INTO A FOLDER

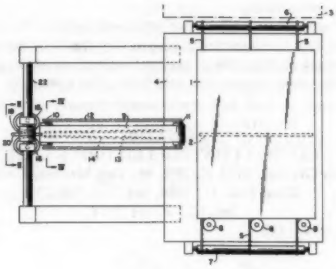
Jan Sabelström, and Sture Wiholm, both of Stockholm, Sweden, assignors to Dynasonic, Johanneshov, Sweden

Filed Apr. 11, 1983, Ser. No. 483,642

Claims priority, application Sweden, Apr. 22, 1982, 8202537

Int. Cl.⁴ B31B *1/56*

U.S. Cl. 493—442 **4 Claims**



1. Apparatus for folding a sheet of material into a folder having a spine and at least one cover side and a bead of binding agent secured to a central portion of said sheet of material that forms the spine of a folder when the sheet is folded into a folder, means for advancing the sheet while maintaining the bead parallel to the advancing direction, means for folding the sheet of material along lines adjacent and parallel to the bead to form covers of the folder, and backup means disposed adjacent said folding means which provides support for said spine and against which the sheet of material is folded during the folding action.

4,557,715

TUCK ASSEMBLY FOR A POCKET FILE FOLDER LINE

Daniel T. Robinson, Greenfield, Wis., assignor to Kempsmith Machine Company, Milwaukee, Wis.

Filed Dec. 1, 1983, Ser. No. 556,928

Int. Cl.⁴ B31B *33/26, 1/78*

U.S. Cl. 493—244 **12 Claims**

1. The combination with a pocket file folder cutting line, a gusset tuck assembly comprising

a tuck section located on each side of the cutting line and including a number of rollers arranged along the path of travel of the edges of the file folder for opening the folded gussets,

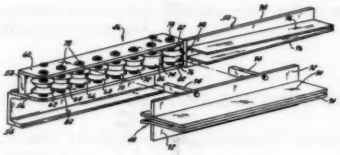
a roller at the downstream end of each of said tuck sections for tucking the open gusset into the edge of said pocket, and

compression means positioned on each side of the cutting line for folding the gusset into the edge of the pocket.

said compression means including a pair of plates downstream from each of said tuck sections for folding the gusset into the edge of said pocket and a guide plate positioned at the end of the tuck sections to prevent the gusset from folding outward from the edge of the file folder pocket by the compressive force of the compression plates.

10. In a pocket file folder cutting line a gusset tuck assembly for tucking the gussets formed on the edges of the pockets into the edges of the pockets, said tuck assembly including on each side of said line,

concave roller means for opening the gussets,



a pair of plates positioned in close proximity to said opening means,

each pair of plates having outwardly bent edges positioned to support the edges of the file folder as the gussets open up,

convex roller means for initially tucking the gusset into the file folder pocket after the gusset is opened by said concave roller opening means,

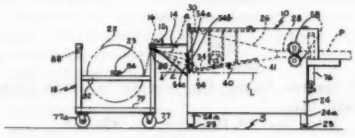
and compression means located downstream of said tucking means for closing the edges of the file folder to fold the gusset into the edge of the pocket.

4,557,716

MECHANISM FOR PRODUCING PAD-LIKE CUSHIONING DUNNAGE FROM SHEET MATERIAL

Gary W. Ottaviano, Bedford Heights, Ohio, assignor to Ranpak Corp., Willoughby, Ohio

Filed Jul. 5, 1983, Ser. No. 510,671
Int. Cl.[4] B31F *1/10*; B65H *19/30*
U.S. Cl. 493—464 **12 Claims**



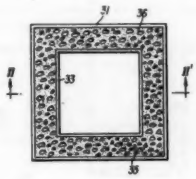
1. In a mechanism for producing low density pad-like cushioning dunnage products from sheet-like stock material, such as for instance paper, comprising a support having means thereon adapted for rotatably mounting a multi-ply roll of sheet-like stock material in operative rotatable position on said mechanism and a stitching means downstream from said support and adapted to receive the sheet-like stock material therein and operable to connect the same into a pad-like cushioning dunnage product, said support having generally fixed coupling means thereon, and a separate mobile cart having generally fixed coupling means thereon coacting with the first mentioned coupling means, for physically connecting said cart to said mechanism, the first and second mentioned coupling means being connectable and separable by generally aligned horizontal linear movement of said cart and said second mentioned coupling means toward or away from said mechanism and said first mentioned coupling means, said cart having means thereon for rotatably mounting a stock roll of sheet-like stock material thereon for feeding into said mechanism for the production of the pad-like cushioning dunnage product, and whereby said cart is operable for supporting a larger roll of stock material in operative position for use by said mechanism as compared to the size of roll of stock material able to be mounted on said support, means on said mechanism for separating the sheets of stock material as the latter move from the roll on said cart toward said stitching means on said mechanism, and a single transversely extending sheet stock engaging means intermediate said stock roll mounting means on said cart and said separating means about which the sheet-like stock material in multi-ply form is adapted to pass prior to passing to said separating means, said stock engaging means being disposed lower than said coupling means and higher than said roll mounting means on said cart.

4,557,717

CUP INSERT FOR BALANCING

Leonard I. Friedman, Silver Spring, Md., assignor to American National Red Cross, Washington, D.C.

Filed Sep. 20, 1982, Ser. No. 420,301
Int. Cl.[4] B04B *9/14*
U.S. Cl. 494—10 **10 Claims**



1. A centrifuge cup insert for use in said centrifuge, said cup insert comprising:

an outer container having a wall and bottom;

an inner container having a wall and bottom disposed within the outer container;

rigid spacer means for maintaining the inner container in a fixed spaced relationship with the outer container, said spacer means being sufficiently strong to withstand forces encountered during operation of said centrifuge;

weight adjustment means for selectively adjusting the overall weight of said cup insert to maintain balance in said centrifuge by adding and removing liquid in said cup insert, said weight adjustment means comprising reservoir means located between the inner and outer containers for holding said liquid; and

inlet means located between the top edges of the inner and outer container walls for permitting the insertion and removal of the liquid from the reservoir means;

wherein the spacer means comprises a rigid porous structure between the inner and outer containers, the openings of which structure a large enough to permit free passage of liquid with not more than minimal capillary effects, and wherein the reservoir means comprises the free space within the structure.

4,557,718

AGENT FOR THE SEPARATION OF DISSOLVED AND/OR UNDISSOLVED MATERIALS OF DIFFERENT BUOYANCY DENSITIES OR DENSITIES BY MEANS OF SOLUTIONS OF TRUE METATUNGSTATES

Rainer Kamps, Genfenbergstrasse 15, 1000 Berlin 20; Bodo Plewinsky, Tietzenweg 30, Berlin 45; Manfred Miehe, Falkenried 4, 1000 Berlin 33, and Klaus Wetz, Eppendorferstieg 4, D 2000 Hamburg 60, all of Fed. Rep. of Germany

Filed Jan. 3, 1984, Ser. No. 567,693

Claims priority, application Fed. Rep. of Germany, Jan. 24, 1983, 3302691; Feb. 14, 1983, 3305517

Int. Cl.[4] B01D *21/26*

U.S. Cl. 494—37 11 Claims

1. In a process for the separation of dissolved and/or undissolved materials of different buoyancy densities by means of a density gradient centrifugation, wherein the materials to be separated are contained in a quantity of a liquid; the improvement which comprises the use, as at least a part of said quantity of liquid, of an aqueous solution of an alkali, ammonium or alkaline earth metal metatungstate.

4,557,719

METHOD AND APPARATUS FOR THE SEPARATION OF MEDIA

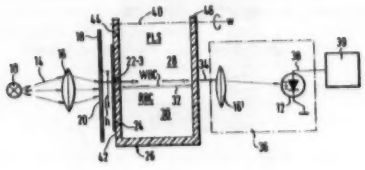
Hans-Jürgen Neumann, and Artur Meisberger, both of St. Wendel, Fed. Rep. of Germany, assignors to Fresenius AG, Bad Homburg, Fed. Rep. of Germany

Filed Jan. 13, 1984, Ser. No. 570,465

Claims priority, application Fed. Rep. of Germany, Jan. 14, 1983, 3301113

Int. Cl.[4] B04B *11/04*

U.S. Cl. 494—37 25 Claims



1. Method of separating flowable and mixed media in a separation apparatus, in particular in a centrifuge, of which at least a first medium is more permeable to optical radiation and at least a second medium is distinguishably less permeable to optical radiation, in which a phase boundary is formed between said separated first and second media, said optical radiation for forming a plurality of beams upon traversal of a detection area, wherein said beams are measured at a measuring means after traversing said detection area through which the separated media flow and a measured result is obtained therefrom and developed into a deviation control signal which is provided to a control means with which an intended phase boundary position is controlled about an intended reference position, the improvement characterized in that a plurality of regions of said detection area are illuminated by said optical radiation and at least one discrete beam path through said media is formed at least in that portion of the measuring means region in which the detection region passes through the region of the measuring means, the beam path being formed in the more radiation-permeable medium, wherein the presence of said beam path to the measuring means is evaluated by a discriminator circuit as a logic one and absence of a beam path to the measuring means is evaluated as a logic zero.

4,557,720

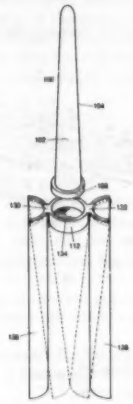
VAGINAL APPLICATOR

Allegra D. Hemphill, 6217 Charnwood Dr., Rockville, Md. 20852

Continuation of Ser. No. 434,828, Oct. 18, 1982, abandoned. This application Jun. 11, 1984, Ser. No. 619,684

Int. Cl.[4] A61B *10/00*

U.S. Cl. 604—1 2 Claims



1. A vaginal swab comprised of an outer housing having a closed and open end on opposing ends thereof, said housing including an annular band defining said open end and a plurality of frangible seams that together define a pair of removable members and a pair of housing segments hingably secured to said annular band following removal of said removable members, a swab core member having a predetermined exterior shape, said core member having an annular base with an outer diameter equal to the inner diameter of said annular band and an adsorbent member secured to said core member, said core member being secured within said housing so that said adsorbent member is enclosed therein.

4,557,721

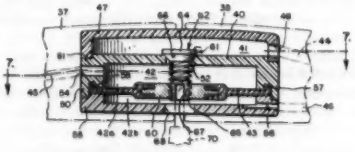
SERVO VALVE

Michael D. Hooven, Miami, Fla., assignor to Cordis Corporation, Miami, Fla.

Filed Nov. 29, 1983, Ser. No. 556,150

Int. Cl.[4] A61M *27/00*

U.S. Cl. 604—9 25 Claims



1. A valve for controlling the passage of body fluids from one location in the body to another location in accordance with an applied control pressure, comprising:

a housing having first, second and third interior chambers;

first partition means in said housing separating said first and second chambers;

inlet port means for establishing fluid communication between said first chamber and the one location;

outlet port means for establishing fluid communication between said second chamber and the other location;

valving means between said first chamber and said second

chamber, said valving means being urged toward closing relationship by the pressure of fluid in said first chamber when said pressure in said first chamber exceeds fluid pressure in said second chamber;

second partition means in said housing including a movable member separating said second and third chambers and movable in response to the pressure differential therebetween;

sensing port means opening into said third chamber for communicating said applied control pressure with said movable member; and

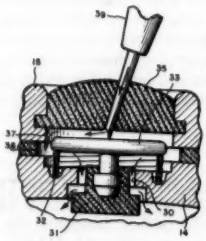
means for coupling said movable member to said valving means whereby said valving means are opened against the pressure of the fluid in said first chamber when said control pressure in said third chamber exceeds fluid pressure in said second chamber.

4,557,722

FILL PORT FOR AN IMPLANTABLE DISPENSING SYSTEM

Donald L. Harris, Miami Beach, Fla., assignor to Cordis Corporation, Miami, Fla.

Filed Apr. 13, 1983, Ser. No. 484,571
Int. Cl.[4] A61M *31/00*
U.S. Cl. 604—9 **10 Claims**



1. A bi-directional fill port for use in conjunction with a hypodermic needle for emptying and filling a subcutaneous fluid reservoir, comprising:

a housing defining a valve chamber having a first aperture, and a second aperture generally opposite said first aperture in fluid communication with the reservoir;

a fluid-impermeable needle-penetrable septum overlying said first aperture;

normally-closed valve means having a biasing means and including a valve member and cooperating valve seat exterior to said chamber for selectively closing said second aperture, said valve member including a stem portion extending through said second aperture into said chamber and a needle-engaging actuator portion within said chamber arranged for engagement by the needle upon insertion of the needle through said septum, said valve member being actuable open by the needle from within said chamber upon the needle coming into operative engagement with said engaging portion.

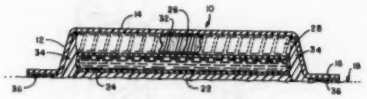
4,557,723

APPLICATOR FOR THE NON-INVASIVE TRANSCUTANEOUS DELIVERY OF MEDICAMENT

Dan Sibalis, Stony Brook, N.Y., assignor to Drug Delivery Systems Inc., New York, N.Y.

Filed Aug. 18, 1983, Ser. No. 524,252
Int. Cl.[4] A61N *1/30*
U.S. Cl. 604—20 **8 Claims**

1. An applicator for the migration of medicament through the skin into the blood stream of a patient comprising: reservoir means for containing said medicament, battery means for supplying a charge for the medicament and being adjacent one side of said reservoir means with the side of said battery means facing said reservoir means for charging the medicament, means for covering comprising an electrically conductive material for partially enclosing said battery means and said reservoir means leaving the side of said reservoir means opposite that of said battery means exposed for contacting said skin, means for electrically connecting the battery means to the cover means, said cover means having a lip defining the periphery of said applicator for making contact with said skin



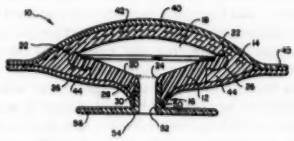
when mounted on said skin leaving said battery means and reservoir means fully enclosed, and electrically conductive adhesive material coating disposed on the underside of said lip, whereby when said applicator is mounted on said skin a complete electrical circuit through said skin is formed and the medicament in said reservoir means migrates out of said reservoir means and through said skin into the blood steam of said patient.

4,557,724

APPARATUS AND METHODS FOR MINIMIZING CELLULAR ADHESION ON PERITONEAL INJECTION CATHETERS

Donald E. Gregonis; Robert L. Stephen; Dennis L. Coleman, all of Salt Lake City; Stephen K. Hunter, Syracuse; Barry K. Hanover, and Jeffrey J. Harrow, both of Salt Lake City, all of Utah, assignors to University of Utah Research Foundation, Salt Lake City, Utah

Continuation-in-part of Ser. No. 235,185, Feb. 17, 1981, Pat. No. 4,405,305, which is a continuation-in-part of Ser. No. 200,830, Oct. 27, 1980, Pat. No. 4,400,167. This application Aug. 12, 1983, Ser. No. 522,914
The portion of the term of this patent subsequent to Aug. 23, 2000, has been disclaimed.
Int. Cl.[4] A61M *25/00*
U.S. Cl. 604—49 **33 Claims**



1. A subcutaneously implantable injection conduit for injecting a drug into a peritoneal cavity, comprising:

a hollow receptacle for receiving the drug, the hollow receptacle having a penetrable portion;

a hollow stem having a proximal end and a distal end, the proximal end of the stem being attached to the receptacle such that the stem forms a passageway extending from the chamber;

a diametrally enlarged flange attached to the stem such that, when the conduit is implanted under a layer of skin adjacent the peritoneal cavity and the flange is secured adjacent the parietal peritoneal membrane, the distal end of the hollow stem is positioned within the peritoneal cavity; and

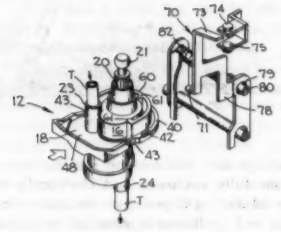
means for inhibiting cellular adhesion comprising a material coating on at least a portion of the conduit.

4,557,725

I. V. PUMP CASSETTE

John A. Heyne, and Leland D. Chamness, both of Mountain View, Calif., assignors to Oximetrix, Inc., Mountain View, Calif.

Filed May 4, 1984, Ser. No. 606,923
Int. Cl.[4] A61N *5/00*
U.S. Cl. 604—67 **12 Claims**



9. I.V. pumping apparatus for pumping liquids to be fed intravenously to a patient comprising a pump driver mechanism including a motor; means for operating and controlling said motor; a reciprocable member operatively connected to said motor and having an enlarged receiver at the lower end thereof, said driver mechanism having a recess on one face thereof into which said receiver extends; clamping members positioned adjacent opposed sides of said recess; a switch arm mounted for lateral movement adjacent one side of said recess; a switch activated by said switch arm to enable said operating and controlling means; and a cassette comprising a rigid body enclosing a pumping chamber, said chamber including an inlet adapted to be connected to tubing leading to a source of I.V. liquid and an outlet adapted to be connected to tubing leading to the patient, said body including a mounting portion extending laterally from the body in a generally horizontal plane and serving to support the body in said driver mechanism recess with said inlet being located at the upper end of the body and said outlet being located at the lower end of the body, a pumping member reciprocably mounted in and extending upwardly from the upper surface of the body for periodically reducing the volume of the pumping chamber and thereby pumping liquid therefrom, said pumping member having a protuberance at the upper end thereof for reception by said reciprocable member of the pump driver mechanism, said mounting portion having recesses on the opposed lateral sides thereof adapted to be received by said clamping members to maintain the cassette in locked engagement, said mounting portion including a rearward extension for adapting the cassette to be gripped for sliding it into an operable position in said recess by placing said lateral sides thereof in supported engagement within said recess in position to be received by said clamping members, and an upstanding switch activator fixedly mounted to the forward end of said mounting portion, said activator extending in a semicircular path adjacent to the leading edge of the mounting portion and extending upwardly from the plane of the mounting portion so as to provide a smoothly curved wall that is arranged to engage said switch arm as the cassette is moved to its operable position.

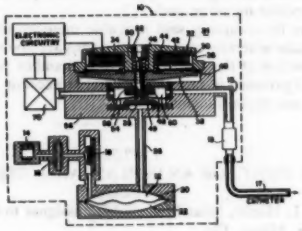
4,557,726

PRECISION MEDICATION DISPENSING SYSTEM AND METHOD

Robert H. Reinicke, Mission Viejo, Calif., assignor to Consolidated Controls Corporation, El Segundo, Calif.

Division of Ser. No. 453,594, Dec. 27, 1982, Pat. No. 4,486,190. This application Sep. 28, 1984, Ser. No. 656,085
Int. Cl.[4] A61M *31/00*
U.S. Cl. 604—67 **9 Claims**

1. In a system for infusing medication into a body, the combination of, a medication reservoir, a pumping chamber, a medication outlet connected to said pumping chamber, an inlet valve between said reservoir and said pumping chamber and including a fixed valve seat and a movable valve element, a movable member forming a wall portion of said pumping chamber and positioned adjacent said movable valve element, an armature connected to said movable member, means for biasing said armature in the direction to urge said movable member into engagement with said movable valve element and



said movable valve element into engagement with said valve seat, thereby normally to provide a substantial closing force for said inlet valve, and electromagnetic means for attracting said armature and moving said movable element away from said movable valve element and in the direction to increase the volume of said pumping chamber thereby to remove said closing force from said inlet valve and permit medication to flow from said reservoir into said pumping chamber.

4,557,727

SPIKE EXCHANGER FOR CONTINUOUS AMBULATORY PERITONEAL DIALYSIS

Alan E. Handt, 705 Pineview, Zionsville, Ind. 46077

Continuation-in-part of Ser. No. 511,555, Jul. 7, 1983, abandoned, which is a continuation-in-part of Ser. No. 371,310, Apr. 23, 1982, Pat. No. 4,405,315. This application Sep. 13, 1983, Ser. No. 531,822
The portion of the term of this patent subsequent to Sep. 20, 2000, has been disclaimed.
Int. Cl.[4] A61M *5/14*; A61J *5/00*
U.S. Cl. 604—80 **22 Claims**

1. A spike exchanger for continuous ambulatory peritoneal dialysis and operable with a first bag with a first port and a second bag with a second port comprising:

a base;

clamp means on said base and engageable with said first port and said second port to releasably limit fluid flow therethrough;

spike holding and moving means movably mounted to said base and operable to releasably hold a spike in fluid communication with said first port and move said spike away from said first port to said second port;

guide means on said base and associated with said spike holding and moving means to guide and align said spike with said second port as said spike is moved thereto; and,

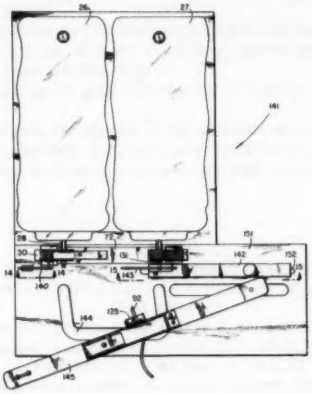
sterile placing means moveably mounted to said base and operable to initially hold and lockingly place sterile means onto said spike and said second port to achieve a sterile environment therebetween.

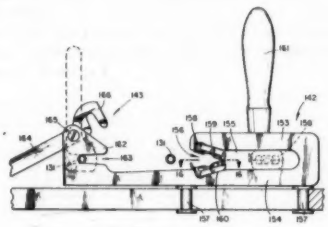
20. A device for placing a sterile clamp on a peritoneal dialysis bag port comprising:

a base upon which a peritoneal dialysis bag may be mounted with the port thereof extending outwardly from said bag;

sterile clamp holding means moveably mounted to said base and having a cavity sized to receive an opened sterile clamp and further having a channel adjacent said cavity sized to receive said clamp only in a closed condition, said

clamp holding means moveable towards said port to contact said clamp against said port and force said clamp





from said cavity into said channel closing said clamp onto said port.

4,557,728

SPRING-OPERATED LIQUID-DISPENSING DEVICE

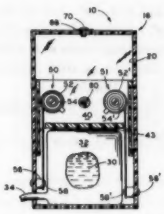
Andrew Sealfon, and Carl Yurdin, both of Port Washington, N.Y., assignors to Repro-Med Systems, Inc., Middletown, N.Y.

Filed Apr. 16, 1984, Ser. No. 600,840

The portion of the term of this patent subsequent to May 8, 2001, has been disclaimed.

Int. Cl.[4] A61M 7/00

U.S. Cl. 604—134 **2 Claims**



1. A spring-operated device for dispensing a liquid for achieving a medical or similar objective, said device comprising a rectangular-shaped housing bounding an internal compartment having a top cover disposed in covering relation over said compartment, said cover having a centrally located slot oriented longitudinally thereof opening into said compartment, a source of liquid in a collapsible bag disposed in said compartment, a slide member disposed in said compartment in pushing contact against said liquid-filled bag, a pair of constant torque springs of the type adapted to assume the form of helical coils disposed along opposite sides of said compartment and each operatively connected at one end to said slide member and at said opposite end to an end of said housing so as to urge said slide member through sliding movement through said compartment in response to said assumption of said helical coils at said end connected to said slide member, an upstanding leg on said slide member in projected relation into said slot of said cover so as to be adapted to track along said slot during said sliding movement of said slide member, a tracking member disposed for tracking movement in said slot of said cover attached to said projecting end of said upstanding leg of said slide member, and a clip means connected to said housing for selectively engaging said tracking member preparatory to commencing the liquid-dispensing service of said device.

4,557,729

COLOR STABILIZATION OF GLYCOSIDES

Robert S. McDaniel, Jr.; Paul R. Glor, both of Decatur, and Hunter L. Kickle, Mt. Zion, all of Ill., assignors to A. E. Staley Manufacturing Company, Decatur, Ill.

Filed May 24, 1984, Ser. No. 613,923
Int. Cl.[4] D06L *3/02*
U.S. Cl. 8—111 12 Claims

1. A process for bleaching glycosides selected from the group consisting of mono and polyglycosides and mixtures thereof comprising the steps of:

(a) exposing the glycoside material to hydrogen peroxide; and

(b) exposing the mixture of the glycoside material and the hydrogen peroxide to a source of sulfur dioxide; and

recovering the bleached glycoside material from the process.

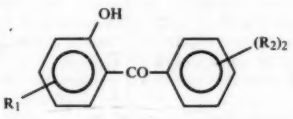
4,557,730

SOLUTIONS OF U.V. ABSORBERS USEFUL FOR IMPROVING THE LIGHT FASTNESS OF DYEINGS ON POLYESTER

Brian Bennett, Bradford, and Donald K. Clough, Bingley, both of England, assignors to Sandoz Ltd., Basel, Switzerland

Filed May 17, 1984, Ser. No. 611,322
Claims priority, application United Kingdom, May 23, 1983, 8314179; Nov. 1, 1983, 8329168
Int. Cl.[4] D06M *13/20*; D06P *1/65, 3/54, 5/22*
U.S. Cl. 8—442 28 Claims

1. A solution comprising one or more U.V. absorbers selected from resorcinol monobenzoate, phenyl salicylate and compounds of formula I



(I)

in which

R_1 is selected from OH, halogen, C_{1-4}alkyl, CN, C_{1-4}alkoxy and hydrogen;

each R_2, independently, is selected from C_{1-4}alkoxy, CN, halogen, hydrogen, C_{1-4}alkyl and OH; and

an emulsifier in an organic solvent system for said U.V. absorber and emulsifier comprising a mixture of a hydrophilic solvent and a hydrophobic solvent.

4,557,731

METHOD FOR DYEING BLENDED FIBER MATERIALS OF CELLULOSE FIBER AND AMIDE NITROGEN-CONTAINING FIBER WITH MONO- AND DI-FUNCTIONAL REACTIVE DYES

Masaaki Sasakura, Nabari, and Kunihiko Imada, Sakai, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Dec. 15, 1983, Ser. No. 561,832
Claims priority, application Japan, Dec. 23, 1982, 57-234058
Int. Cl.[4] D06P *1/38, 3/87*
U.S. Cl. 8—531 15 Claims

1. A method for dyeing a blended fiber material made up of cellulose fiber and nitrogen-containing fiber selected from the group consisting of natural nitrogen-containing fibers and synthetic polyamide fibers, which comprises contacting the material with a dye bath containing a reactive dye having two or more fiber-reactive groups different from each other and a reactive dye having one fiber-reactive group, whereby the material can be dyed by a one-bath, one-step method.

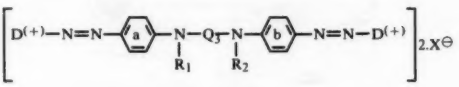
4,557,732

PROCESS FOR SPIN-DYEING OF ACID-MODIFIED POLYMERS OF ACRYLONITRILE BY THE WET-SPINNING PROCEDURE USING QUATERNARY AMMONIUM OR CYCLAMMONIUM DYESTUFFS OF LOW M VALUE AND HIGH CATION WEIGHT HAVING TWO OR THREE SAID AMMONIUM OR CYCLAMMONIUM GROUPS

Manfred Hähnke, Kelkheim; Reinhard Mohr, Offenbach am Main, and Kurt Hohmann, Neu-Isenburg, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 420,516, Sep. 20, 1982, abandoned, which is a continuation of Ser. No. 225,851, Jan. 16, 1981, abandoned, which is a continuation of Ser. No. 40,760, May 21, 1979, abandoned. This application Oct. 4, 1983, Ser. No. 538,800
Claims priority, application Fed. Rep. of Germany, May 26, 1978, 2822913
Int. Cl.[4] D06P *7/00, 3/70*
U.S. Cl. 8—538 9 Claims

1. In a process for spin-dyeing an acid-modified polymer or copolymer of acrylonitrile with a quaternary dyestuff according to the wet-spinning procedure, the improvement consisting essentially of employing, as a quaternary dyestuff, a dyestuff which has a migration factor M of 20 or less, a combination index K of less than 2.5 and a cation weight CW of more than 310, and which corresponds to the formula



in which

$D^{(+)}$, being identical to or different from one another, each is the radical of a quaternary ammonium, lower dialkylhydrazonium or cycloammonium diazo component,

Q_3 is lower alkylene or lower alkylene interrupted by —O—, —NH— or an aromatic carbocyclic radical,

R_1 and R^2, being identical to or different from one another, each is hydrogen or lower alkyl or lower alkyl substituted by one or two of the substituents hydroxy, acetoxy, lower alkoxy, cyano, lower carbalkoxy, chlorine, phenyl; phenyl substituted by halogen, lower alkyl, lower alkoxy, nitro, acetylamino, sulfamoyl or carbamoyl; carbamoyl and carbamoyl substituted by lower alkyl, a phenyl, or a benzyl; or

R_1 and R_2 conjointly with the two nitrogen atoms and the radical Q_3 form a heterocyclic ring,

the benzene nuclei a and b each are unsubstituted or substituted in an identical or different manner, the substituents being 1 or 2 of the substituents lower alkyl, lower alkoxy, halogen trifluoromethyl or lower alkanoylamino, or

the benzene nuclei a or b or both contain a fused benzene ring thus forming in a naphthylene, and

$X^{(-)}$ is the equivalent of an anion.

4,557,733

FORMCOKE PROCESS

Jimmy B. Smith, and Julian M. Liggett, both of Columbia, Tenn., assignors to Peabody Development Company, St. Louis, Mo.

Filed Nov. 5, 1984, Ser. No. 667,974
Int. Cl.[4] C10L *5/04, 5/16, 5/28, 5/30*
U.S. Cl. 44—10 C 7 Claims

1. A process for producing formcoke comprising

igniting sized green coal,

charring the ignited green coal and reducing the volatile content thereof by continuously feeding the same along a path through a pre-treatment carbonizer, said pre-treatment carbonizer being a static bed reactor having con-

trolled amounts of air updrafted through the bed through airbox zones, to provide an oxidizing atmosphere in which the green coal is charred and a reducing atmosphere above the bed,

further reducing the volatile content of the char by feeding the same through a post-treatment carbonizer having a reducing atmosphere,

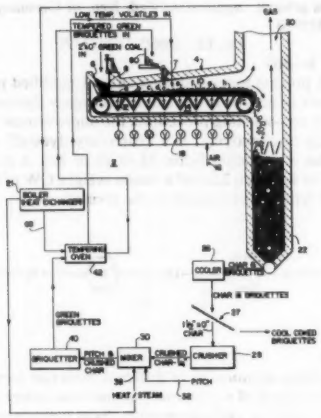
passing the char from the post-treatment carbonizer through a cooler,

crushing the cooled char,

mixing the crushed char with pitch,

forming the mixture of crushed char and pitch into green briquettes,

tempering the green briquettes by passing them through a tempering oven,



adding the tempered briquettes from the tempering oven as an overburden on top of the ignited green coal part-way along the path through the pre-treatment carbonizer and thereby passing the added tempered briquettes through the reducing atmosphere on top of the bed of ignited green coal through the latter part of the path through the pre-treatment carbonizer, then through the post-treatment carbonizer and through the cooler, and

separating the cooled briquettes from the char,

wherein the briquettes are tempered in an inert atmosphere provided by exhaust gases recycled from the carbonizers, and the volatiles driven off from the briquettes during the tempering process are recycled into the atmosphere of the pre-treatment carbonizer.

4,557,734

MICROEMULSIONS FROM VEGETABLE OIL AND LOWER ALCOHOL WITH OCTANOL SURFACTANT AS ALTERNATIVE FUEL FOR DIESEL ENGINES

Arthur W. Schwab, and Everett H. Pryde, both of Peoria, Ill., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Aug. 8, 1984, Ser. No. 638,826
Int. Cl.[4] C10L *1/18*
U.S. Cl. 44—53 **9 Claims**

1. A hybrid fuel composition comprising:

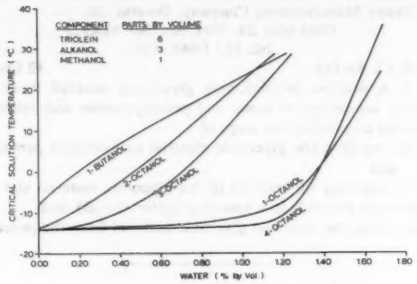
(a) a vegetable oil;

(b) a lower alcohol selected from methanol and ethanol;

(c) optionally, water; and

(d) a surfactant comprising a straight-chain isomer of octanol;

wherein said octanol surfactant is present in the fuel composition in an amount effective for said composition to exist as a thermodynamically stable microemulsion and the combined amounts of lower alcohol, water, and surfactant relative to said vegetable oil are sufficient to impart to said



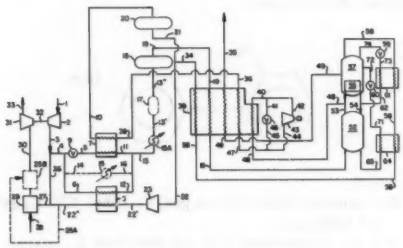
composition a kinematic viscosity in the range of 2-9 centistokes at 37.8° C.

4,557,735

METHOD FOR PREPARING AIR FOR SEPARATION BY RECTIFICATION

Reginald A. Pike, Grand Island, N.Y., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Feb. 21, 1984, Ser. No. 581,536
Int. Cl.[4] B01D *53/04*
U.S. Cl. 55—26 **15 Claims**



1. A method for preparing feed air for separation by cryogenic rectification in a double column air separation facility, whereby the preparatory steps of compression, cooling and cleaning of the feed air are carried out by an integrated system, comprising:

(a) compressing feed air;

(b) cooling the compressed feed air;

(c) passing the cooled, compressed feed air through a first purifier containing heat regenerable adsorbent wherein the air is substantially cleaned of impurities by transfer of the impurities to the adsorbent;

(d) introducing the cleaned, cooled, compressed feed air into an air separation facility wherein a higher pressure column and a lower pressure column are in heat exchange relation;

(e) separating the feed air by cryogenic rectification in the air separation facility into nitrogen-rich and oxygen-rich components;

(f) withdrawing a nitrogen-rich portion from the higher pressure column, expanding the withdrawn portion and warming the expanded withdrawn portion by indirect heat exchange with the cleaned, cooled, compressed feed air prior to its introduction into the air separation facility;

(g) warming the withdrawn expanded portion by indirect heat exchange with at least a portion of the cooling compressed feed air of step (b);

(h) passing the warmed portion through a second purifier containing heat regenerable adsorbent which contains

impurities so as to transfer those impurities to the warmed portion and thus clean the adsorbent;

(i) expanding the impurity-containing portion through an expansion turbine for the production of external work;

(j) employing at least a portion of said external work to compress the feed air of step (a); and

(k) periodically switching the first and second purifiers so that during the switched time the cooled compressed feed air passes through the second purifier containing adsorbent which has been cleaned during the previous period, and the warmed portion passes through the first purifier to remove impurities from the adsorbent deposited there during the previous period.

4,557,736
BINARY ION EXCHANGED TYPE X ZEOLITE ADSORBENT

Shivaji Sircar, Wescosville; Roger R. Conrad, Trexlertown, and William J. Ambs, Clifton Heights, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Oct. 29, 1984, Ser. No. 665,794
Int. Cl.[4] B01D *53/04*
U.S. Cl. 55—62 **11 Claims**

5. A process for producing an oxygen-enriched stream from a gas stream comprising nitrogen and oxygen, said process comprising: contacting said gas stream with a binary ion exchanged Type X zeolite adsorbent so as to adsorb a portion of the nitrogen present in said gas stream wherein between 5% and 40% of the available ion sites on the adsorbent are occupied by Ca and between 60% and 95% are occupied by Sr.

4,557,737
OIL GAS SEPARATION

Ian C. Callaghan, Wokingham, England; Hans-Ferdi Fink, Essen, Fed. Rep. of Germany; Clive M. Gould, Staines, England; Götz Koerner, Essen; Hans-Jürgen Patzke, Gelsenkirchen-Resse, and Christian Weitemeyer, Essen, all of Fed. Rep. of Germany, assignors to The British Petroleum Company p.l.c, London, England

Division of Ser. No. 482,202, Apr. 5, 1983. This application Sep. 28, 1984, Ser. No. 655,523
Int. Cl.[4] B01D *47/08*
U.S. Cl. 55—87 **9 Claims**

1. A method for breaking a microgas dispersion to separate crude oil containing associated gas into liquid oil and gas wherein said microgas dispersion separation is carried out in the presence of an effective amount of a polysiloxane anti-foam agent characterized by the fact that the polysiloxane anti-foam agent is a polysiloxane containing components of molecular weight in the range of 83,000 to 305,000 and containing not more than 2.8% by weight of components of molecular weight 7,100 or lower, not more than 28% by weight of components of molecular weight 83,000 or lower, not more than 14.5% by weight of components of molecular weight 305,000 or higher, and not more than 0.013% by weight of components of molecular weight 1,750,000 or higher, molecular weights being expressed as polystyrene equivalent molecular weights.

4,557,738
VACUUM COLLECTOR

David R. Menasian, 12140 Powerhouse Rd., Potter Valley, Calif. 95469

Filed May 26, 1982, Ser. No. 382,447
Int. Cl.[4] B01D *46/00*
U.S. Cl. 55—288 **18 Claims**

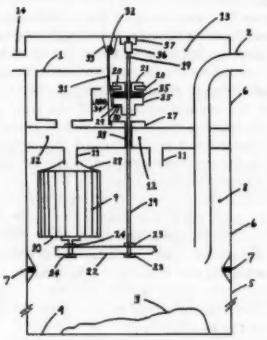
1. A high-suction portable, hybrid shop-style and continuous-duty vacuum collector, whose arrangement also has special purpose applicability, with improved capability and effectiveness in extending the running time between filter cleanings while filtering a wide range of sizes and weights of mixed dust and particulate debris from gases such as air and incorporating a compact, efficient and simple filter-cleaning mechanism that protects the operator and the environment from exposure to dust during cleaning but cannot accidentally be activated during the dirt collection process, comprising:

a detachable rigid air-tight dust-accumulating enclosure, open on top, into which the incoming particulate-laden gas flows from an inlet on entering in a direction to avoid striking any filter surfaces directly, and which collects the heavier particles by gravity on the bottom of said dust enclosure; and

filter assembly means for producing a very large total filter surface area by mounting as an integral assembly, at least one gas-penetrable and dust-impervious hollow pleated filter, in which the normal directions to all of the filter surfaces are placed in a plane and are thus confined to two dimensions of three-dimensional space, and with this filter surface orientation no filter surface faces or has its normal in the third dimension, in order to collect the lighter particles and the dust on the outside of said oriented filter surfaces, and carried on a housing completely covering said open top of said dust enclosure so as to constitute a closed dust chamber containing said filter assembly, and which communicates with the clean gas region of said housing only through said filter; and

filter cleaning means, further comprising:

filter moving means for constrained motion of said inte-



gral filter assembly as a unit only in said third dimension, and operated from outside said housing without having to disconnect any connections or subject said filter surfaces to any deformation; and

filter shock means for subjecting said integral filter assembly as a unit to a sharp impact shock in said third dimension by abruptly arresting said motion in order to dislodge said particles and dust adhering to the outside of said filter surfaces, enabling them to fall by gravity to said bottom of said dust enclosure; and

flexible filter connection means for maintaining the integrity of the internal gas passages from said filter assembly to the clean gas region of said housing while said motion and said shock are being applied, so that none of said particles and dust either enter said clean gas region or are dispersed to the external environment; and

suction means for applying blower suction to said clean gas region and thence to the clean gas inside of said integral filter assembly through said flexible filter connection means; and

an outlet from said housing for discharging into the surrounding atmosphere the filtered air from said suction means; and

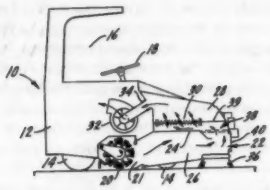
interlock means for rendering said filter cleaning means inoperable when said suction means is operating.

4,557,739

SWEEPER WITH PRECLEANER AND/OR DEMISTER

Lloyd D. Fortman, Minneapolis, and Mark D. Kinter, Spring Park, both of Minn., assignors to Tennant-Company, Minneapolis, Minn.

Filed Aug. 27, 1984, Ser. No. 644,626
Int. Cl.[4] B01D *50/00*
U.S. Cl. 55—320 16 Claims



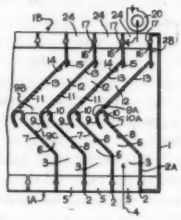
1. In a sweeper, a mobile frame, wheels for the frame providing for its movement, a generally horizontal rotary brush on the frame adapted to propel debris from a surface to be cleaned, a debris receiving hopper with an inlet opening therein on the frame adapted to receive debris thrown by the brush, two chambers in the hopper, one chamber being a debris chamber for receiving debris from the brush and the other being a filter chamber with a filter unit therein, a vacuum fan on the frame for exhausting air from the hopper and connected to the filter chamber to reduce dusting and to draw air through the filter unit, an opening between the chambers remote from the brush providing for an air flow from the debris chamber to the filter chamber to reduce dusting around the sweeper, and a precleaner for separating some of the dust particles passing through the opening between the debris chamber and the filter chamber constructed and arranged to separate dust particles entrained in the airstream created by the vacuum fan before the airstream enters the filter chamber from the debris chamber, the precleaner including two spaced plates with a series of openings in each plate, the openings in one plate being offset relative to the openings in the other plate, the openings having a smaller dimension than the distance between the openings so that an opening in one plate is overlapped by a plate area in the next plate, thereby requiring the airflow to change direction in flowing from the openings in one plate to and through the openings in the next plate.

4,557,740

WEATHER LOUVER

Richard L. Smith, Louisville, Ky., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Sep. 10, 1984, Ser. No. 648,517
Int. Cl.[4] B01D *45/00*
U.S. Cl. 55—440 3 Claims



1. In a weather louver for separating liquid particles from a flowing air stream as it passes through said weather louver from the front to the rear thereof in a generally longitudinal direction along a zigzag flow path, said weather louver having:

a housing;

a plurality of vanes each including an inlet wall, a diagonal wall, a connecting wall, and an outlet wall, said vanes each having a similar cross sectional configuration and mounted in said housing in transverse spaced parallel relation to each other with said respective walls of immediately adjacent vanes defining therebetween a zigzag air stream passage extending in said longitudinal direction through said weather louver;

said air stream passage including, in said longitudinal direction of flow of said air stream, an inlet portion defined by said spaced adjacent inlet walls, a diagonal portion defined by said spaced adjacent diagonal walls extending at a first transverse angle away from said longitudinal direction, a connecting portion defined by said spaced adjacent connecting walls extending at a second transverse angle back toward said longitudinal direction and an outlet portion defined by said spaced adjacent outlet walls;

The improvement comprising;

a first arcuate part projecting part way into one side of said air stream passage at the juncture of said diagonal and connecting walls of one of said vanes;

a second arcuate part projecting part way into the other side of said air stream passage at the juncture of said diagonal and connecting walls of an immediately adjacent vane;

said first and second arcuate parts defining therebetween a first venturi at the juncture of said diagonal and connecting walls for accelerating the velocity of said liquid particles;

said second arcuate part having a deflector extending upstream into said diagonal portion of said air stream passage to define a second venturi upstream of said juncture of said diagonal and connecting walls for accelerating the velocity of said liquid particles;

said deflector and diagonal wall defining an opening for entry of liquid into said second arcuate part; and

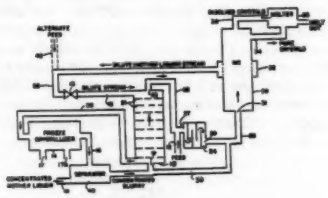
said connecting wall having an impact surface downstream from said first and second venturi against which said liquid particles impinge for collection and removal.

4,557,741

GRADIENT COLUMN FREEZE CONCENTRATION SYSTEM

Wilhelmus H. J. M. Van Pelt, 's-Hertogenbosch, Netherlands, assignor to Grasso's Koniklyke Machine Fabriekon N.V., 's-Hertogenbosch, Netherlands

Filed Feb. 13, 1984, Ser. No. 579,512
Int. Cl.[4] B01D *9/04*
U.S. Cl. 62—541 6 Claims



1. In a subassembly for preparing crystals for washing having a concentration gradient column having an inlet and an outlet containing a plurality of stages each containing a slurry of mother liquor and crystals, the concentrations of the slurry in each stage being different and varying from concentrated at the inlet of the column to dilute at the outlet, said column having means for receiving a concentrated slurry prior to or at the inlet and delivering dilute liquor at the outlet, said column also including means for removing concentrated mother liquor at the inlet and means for removing dilute slurry from the other end; and holding tank means coupled directly to the outlet of the gradient column for receiving and storing dilute slurry to

increase the residence time of said crystals in said dilute slurry to enable the crystals contained therein to ripen and grow in size, and feeding out a slurry with larger crystals at an outlet, the improvement comprising means for feeding back a portion of the slurry at the outlet of said holding tank to the inlet of said gradient column and means for enabling the smaller crystals in said concentrated slurry to dissolve and reform on said larger crystals in said fed back slurry.

4. A freeze concentration process comprising:

cooling a first stream containing a solute to form a slurry of essentially pure solvent crystals in a concentrated mother liquor, said crystals having mother liquor adhered to the surfaces of said crystals;

substituting a less viscous dilute mother liquor for said concentrated mother liquor to form a dilute slurry in a gradient column;

passing said dilute slurry directly to a holding tank to allow said crystals to dwell in said dilute mother liquor to enlarge the size of the crystals;

passing said dilute slurry with enlarged crystals to a purifier for removing dilute mother liquor from the surface of the enlarged crystals;

supplying feed to said dilute stream of dilute slurry;

feeding back a portion of the slurry at the outlet of said holding tank to the inlet of said gradient column; and

causing the smaller crystals in said concentrated slurry to dissolve and reform on said larger crystals in said fed back slurry.

4,557,742

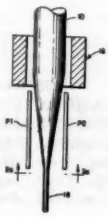
POLARIZED OPTICAL FIBER AND METHOD OF FORMING SAME

Lawrence E. Thigpen, Merrimac, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jul. 2, 1984, Ser. No. 627,040

Int. Cl.⁴ C03B *37/025, 37/10*

U.S. Cl. 65—2 **12 Claims**



1. A method for forming an optical fiber having an inherent birefringence comprising the steps of

cooling a heated glass optical fiber through a given temperature range from a relatively high temperature of low viscosity, permitting orientation of its microcrystalline structure, to a relatively low temperature of high viscosity, substantially precluding alteration of its microcrystalline structure; and

applying an electric field of given orientation across said optical fiber during said cooling step to initially orient the microcrystalline structure of the fiber when it is at said high temperature and maintain said orientation until said fiber is cooled to low temperature.

4,557,743

METHOD OF AND APPARATUS FOR MONITORING THE REDOX STATE OF ELEMENTS IN GLASS

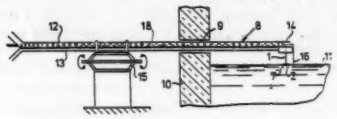
Paul Claes, Court Saint Etienne; Christian Dauby, Gerpinnes; Camille Dupont, Heppignies, and Luc Van Cangh, Pont à Celles, all of Belgium, assignors to Glaverbel, Brussels, Belgium

Filed Aug. 31, 1984, Ser. No. 646,443

Claims priority, application United Kingdom, Sep. 1, 1983, 8323519

Int. Cl.⁴ C03B *5/16*

U.S. Cl. 65—29 **22 Claims**



1. A method of monitoring the redox state of at least one element in glass, comprising:

(a) immersing a working electrode and an auxiliary electrode in the glass while the glass is molten;

(b) applying a scanning potential to the working electrode, with a series of potential pulses being superimposed on the scanning potential; and

(c) monitoring the resulting current between the electrodes to give an indication of the redox state of the at least one element in the glass.

15. Apparatus for monitoring the redox state of elements in glass, comprising:

(a) a working electrode and an auxiliary electrode constructed for immersion in molten glass;

(b) means connected to said electrodes for applying a scanning potential to said working electrode and for superimposing potential pulses on the scanning potential; and

(c) means operatively associated with said electrodes for monitoring resulting current flow between the electrodes.

4,557,744

MOULD ARRANGEMENT FOR A GLASSWARE FORMING MACHINE

Frank A. Fenton, Wheatley; Brian Booth, Sheffield; Stanley P. Jones, Tickhill, and Derek Gennard, Maltby, all of England, assignors to Emhart Industries, Inc., Farmington, Conn.

Continuation of Ser. No. 433,133, filed at PCT GB82/00047, Feb. 22, 1982, published as WO82/02881, Sep. 2, 1982, § 102(e) Date Sep. 30, 1982, abandoned. This application Apr. 9, 1984, Ser. No. 597,989

Claims priority, application United Kingdom, Feb. 27, 1981, 8106257; Feb. 27, 1981, 8106259

Int. Cl.⁴ C03B *9/38*

U.S. Cl. 65—29 **10 Claims**

1. A mold arrangement for a cyclically-operating glassware forming machine comprising:

at least two mateable mold portions;

two mold portion holders, each arranged to support at least one of said mold portions, the mold portion holders being movable relative to one another to bring the mold portions supported thereby into engagement to form a mold or to separate the mold portions;

a first electrical temperature sensing device mounted on one of the mold portions;

a pair of first electrical contact members operatively connected to said first electrical temperature sensing device;

a pair of second electrical contact members operatively secured to said one of said mold portion holders and adapted for mateable engagement with said first electrical contact members when said mold portion is supported by its associated mold portion holder;

control means for reading a predetermined temperature signal ouput of said first electrical temperature sensing

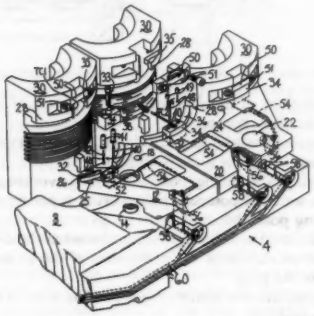
device and for controlling a portion of the operation of said machine in accordance with said predetermined temperature signal output;

conducting means operatively connecting said second electrical contact members to said control means;

means for producing a signal at a predetermined point in each cycle of operation of said machine and means for communicating said signal to said control means;

means responsive to said signal for causing said control means to read said predetermined temperature signal ouput at said predetermined point.

9. In a cyclically operating glassware forming machine comprising two mold portion holders arranged to support at least one mold portion, the mold portion holders being movable relative to one another to bring the mold portion supported thereby into engagement to form a mold or to separate the mold portions, an electrical temperature sensing device mounted on one of said mold portions, electrical contact members connecting said electrical temperature sensing device to control means, said control means being operable to read the signal generated by said temperature sensing device and to control a portion of the operation of said machine in accordance with the value of the read signal, the method comprising the steps of:



selecting a predetermined point in each cycle of operation of said machine;

reading the output of said temperature sensing device at said predetermined point;

controlling at least a portion of the operation of said machine in accordance with said output of said temperature sensing device at said predetermined point.

4,557,745

BENDING OF GLASS SHEETS ON A SHAPING BED CONSISTING OF ROTATING ELEMENTS

Friedrich Halberschmidt, Herzogenrath; Josef Audi, Aachen, both of Fed. Rep. of Germany; Herbert Radermacher, Faeren, Belgium, and Norbert Schwarzenberg, Herzogenrath, Fed. Rep. of Germany, assignors to Saint-Gobain Vitrage, Courbevoie, France

Filed Nov. 9, 1984, Ser. No. 669,872

Claims priority, application France, Nov. 9, 1983, 83 17829

Int. Cl.[4] C03B *23/033*

U.S. Cl. 65—104 **19 Claims**

1. A process for bending a horizontally oriented sheet of glass, comprising the steps of:

conveying in a first direction a sheet of glass heated to a conveying temperature onto a shaping bed having rotating shaping elements, said shaping elements being curved and extending transverse to said conveying direction;

using said shaping elements to preliminarily curve said sheet;

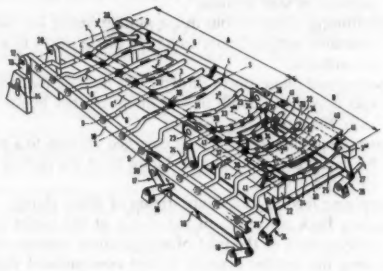
conveying said preliminarily shaped sheet to a position above a lower frame shaped mold of a bending press, said position being below an upper solid-surface countermold of said press;

raising said lower frame sufficiently to press said sheet against said upper countermold so as to finally shape said sheet; and

lowering said lower frame.

3. An apparatus for bending a horizontally oriented sheet of glass, comprising:

a shaping bed having a plurality of shaping elements, said shaping elements being rotatable about parallel axes to convey a glass sheet in a conveying direction transverse to



said axes, said plurality of shaping elements being spaced along said conveying direction and having portions curved out of alignment with said axes;

means for providing spaces between said shaping elements of a downstream portion of said shaping bed and a lower surface of said sheet;

a mold member positionable in said spaces;

a convex solid surface countermold positioned above said mold member and above said sheet when said sheet is on said shaping elements of said downstream portion; and

means for raising said mold member to said countermold so as to press a glass sheet therebetween.

4,557,746

ELECTRO-PNEUMATIC ACTUATOR FOR GLASSWARE FORMING MACHINE

David Braithwaite, Doncaster, England; Richard A. Walker, North Granby, Conn.; Wasyl Bystrianyk, Simsbury, Conn.; Paul F. Scott, Granby, Conn., and Robert J. Douglas, North Granby, Conn., assignors to Emhart Industries, Inc., Farmington, Conn.

Continuation of Ser. No. 520,396, Aug. 4, 1983, abandoned. This application Jun. 3, 1985, Ser. No. 741,017

Int. Cl.[4] C03B *9/40*

U.S. Cl. 65—163 **14 Claims**

1. An apparatus for providing controlled motion of a mechanism in a glassware forming machine, comprising:

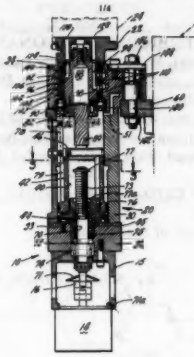
a motor;

a threaded shaft rotated by said motor;

a piston and cylinder assembly, fluidically activated to move the piston in opposite first and second directions, said piston being drivingly coupled to said mechanism; and

a control nut in threaded engagement with said threaded shaft, which is longitudinally moved by the rotation of the shaft in the first and second directions, said control nut

being non-rotatably mounted relative to said piston and cylinder assembly so as to contiguously engage said piston



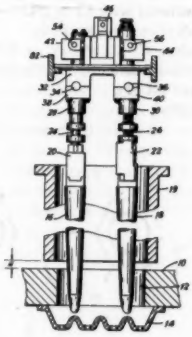
to limit its motion in the first direction, and to disengage said piston to permit free motion in the second direction.

4,557,747

MULTIPLE-DROP FEEDING SYSTEM OF MOLTEN GLASS AND OF OTHER MATERIALS

Alide Boschi, Monterrey, Mexico, assignor to Vitro Tec Fideicomiso, Monterrey, Mexico

Filed Dec. 14, 1983, Ser. No. 561,533
Claims priority, application Mexico, Dec. 15, 1982, 195648
Int. Cl.⁴ C03B *7/08*
U.S. Cl. 65—328 **5 Claims**



1. In a multiple gob glass feeder system having a conventional feeder bowl with a lower outlet spout over which the molten glass is adapted to flow in response to vertical reciprocating motion of two plungers and a revolving tube arranged coaxially with said plungers in order to uniformize the temperature and composition of the molten glass, the improvement comprising:

a. support means for said plungers, including pivotal means for each plunger,

b. supporters positioned at the support means, which serves to fasten the upper end of each plungers, and

c. an angularly adjustable mechanism, coupled between said supporters, which serves to graduate angularly and symmetrically the vertical position of said plungers.

4,557,748

METHOD OF LOWERING THE MAGNESIUM IMPURITY LEVEL OF WET-PROCESS PHOSPHORIC ACID DURING PRODUCTION OF LIQUID FERTILIZER

Norman L. Stewart, Jr., Lake Alfred, Fla., and Ken E. Kranz, Kansas City, Mo., assignors to Farmland Industries, Inc., Kansas City, Mo.

Filed Aug. 24, 1984, Ser. No. 644,331
Int. Cl.⁴ C05B *7/00, 1/00;* C01F *1/00;* C01B *25/16*
U.S. Cl. 71—32 **10 Claims**

1. A process for preparing a wet process phosphoric acid based liquid fertilizer having a reduced tendency to form precipitates, said method comprising the steps of:

providing a quantity of weak wet process phosphoric acid having a magnesium impurity level of greater than about 0.4% MgO on a 68% P_2O_5 basis and which would cause liquid fertilizer prepared therefrom to have an undesirable level of precipitates;

initially evaporating said quantity of acid to form semi-concentrated acid having a P_2O_5 content of from about 42% to less than 45%;

aging said semi-concentrated acid for a period of from at least about 24 hours to about 144 hours under conditions for altering magnesium crystals within the semi-concentrated acid in order to facilitiate centrifugal separation thereof, said aging conditions including maintaining the semi-concentrated acid at a temperature within the range of from about 145° F. to about 220° F. throughout the aging period by means of supplemental heating of the semi-concentrated acid;

centrifuging the aged acid to remove altered magnesium crystals therefrom,

said aging and centrifuging steps being carried out such that the centrifuged acid has a magnesium impurities level of no more than about 0.4% MgO on a 68% P_2O_5 basis;

further evaporating said centrifuged acid to a desired P_2O_5 concentration necessary for production of liquid fertilizer; and

preparing a liquid fertilizer product from said centrifuged acid.

4,557,749

CONDITIONING DEVICE FOR HYDROSOLUBLE FERTILIZERS AND/OR OTHER PRODUCTS

Jeanne Berthet, Velizy Villacoublay; Marie-Francoise Blin, Versailles; Gilbert Gaussens, Meudon, and Jean R. Noaillac, Athis-Mons, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Sep. 21, 1982, Ser. No. 420,907
Claims priority, application France, Sep. 24, 1981, 81 18012
Int. Cl.⁴ C05G *3/04*
U.S. Cl. 71—64.11 **12 Claims**

1. A device for conditioning hydrosoluble fertilizers and/or hydrosoluble products usable in agriculture comprising a sealed container having a plurality of walls, at least one of the walls comprising a membrane having a thickness of about 0.1 to about 0.2 mm said membrane being formed of a grafted polymer powder comprising a hydrophobic polymer powder selected from the group consisting of a polyolefin and an ethylene vinyl acetate copolymer, said hydrophobic polymer powder being grafted by hydrophilic monomers selected from the group consisting of acrylic acid and vinyl pyrrolidone, the amount of grafted hydrophilic monomers being 25 to 50% based on the weight of said hydrophobic polymer, said grafted polymer powder being shaped to provide said membrane and to form said container, said container containing the fertilizers and/or hydrosoluble products, and said membrane passing said fertilizers and/or hydrosoluble products at a daily rate of at least 1,000 $\mu g/cm^2$ based on the area of the membrane.

4,557,750

SULFINAMIDE DERIVATIVES, A PROCESS FOR PREPARING THE DERIVATIVES AND HERBICIDES CONTAINING THE SAME

Tetsuya Imai; Kenichi Toyohara; Takeshi Goto, all of Naruto; Tadateru Murata, Itano; Akihide Ando; Toshiro Uchida, both of Naruto, and Izuru Yamamoto, Setagaya, all of Japan, assignors to Otsuka Kagaku Yakuhin Kabushiki Kaisha, Osaka, Japan

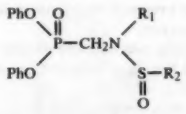
PCT No. PCT/JP82/00122, § 371 Date Sep. 7, 1982, § 102(e) Date Sep. 7, 1982

PCT Filed Apr. 15, 1982, Ser. No. 422,910

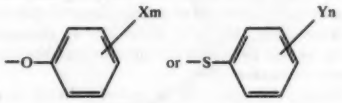
Int. Cl.⁴ A01N *57/10*; C07C *145/00*; C07F *9/02*

U.S. Cl. 71—87 **2 Claims**

1. Sulfinamide derivative represented by the formula

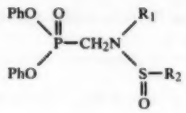


wherein R_1 represents an alkoxy (C_{1-6}) carbonylmethyl group or cyanomethyl group; R_2 represents a group

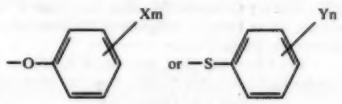


in which X and Y are each an alkyl group having 1–6 carbon atoms or alkoxy group having 1–6 carbon atoms and m and n are 0 or an integer of 1 to 3); and Ph represents phenyl.

2. A herbicide composition containing a diluent and a sulfinamide derivative represented by the formula



wherein R_1 represents alkoxy (C_{1-6}) carbonylmethyl group or cyanomethyl group; R_2 represents a group



(in which X and Y are each an alkyl group having 1–6 carbon atoms or alkoxy group having 1–6 carbon atoms and m and n are 0 or an integer of 1 to 3); and Ph represents phenyl.

4,557,751

COMPOSITIONS CONTAINING SURFACTANT AND BROADLEAF FOLIAR HERBICIDE

Patricia M. Ronning, and Gregg A. Vandesteeg, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 10, 1981, Ser. No. 242,174

Int. Cl.⁴ A01N *25/30*

U.S. Cl. 71—91 **13 Claims**

1. Herbicidal compositions, comprising:

(a) a broadleaf foliar herbicide, and

(b) a surface-active agent, comprising at least one ethoxylated C_{12-18} unsaturated fatty acid, ethoxylated C_{12-18} unsaturated fatty amine, or ethoxylated C_{12-18} unsaturated fatty amide, said surface-active agent containing an average of about 2 to 40 oxyethylene radicals per molecule.

4,557,752

HERBICIDAL SULFONAMIDES

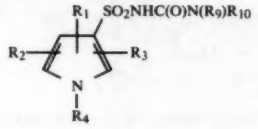
John C. Budzinski, West Chester, Pa., and George Levitt, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 424,476, Sep. 27, 1982, Pat. No. 4,473,394, which is a continuation-in-part of Ser. No. 144,856, Apr. 29, 1980, abandoned. This application Jul. 26, 1984, Ser. No. 634,487

Int. Cl.⁴ C07D *491/048, 491/052*; A01N *47/36*

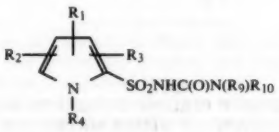
U.S. Cl. 71—92 **18 Claims**

1. A compound of the formula:



Ia

or



Ib

wherein

R_1 is H, C_1–C_4 alkyl, NO_2, CN, $C(O)CCl_3$, SO_2R_{11}, $C(O)R_5$ or CO_2H;

R_2 is H or C_1–C_4 alkyl;

R_3 is H, C_1–C_4 alkyl, Cl or Br;

R_4 is H, C_1–C_4 alkyl, cyanoethyl, C_5–C_6 cycloalkyl, benzyl, phenyl substituted with Cl or NO_2, or $C(O)R_6$;

R_5 is C_1–C_4 alkyl or C_1–C_4 alkoxy;

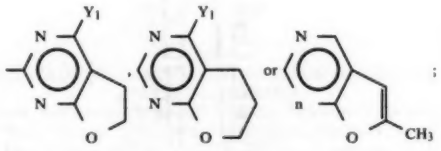
R_6 is C_1–C_4 alkyl, C_1–C_4 alkoxy, or NR_7R_8;

R_7 and R_8 are independently C_1–C_2 alkyl;

R_9 is H, CH_3 or OCH_3;

R_{11} is C_1–C_4 alkyl;

R_{10} is



and

Y^1 is H, CH_3, OCH_3, Cl or OCH_2CH_3;

and their agriculturally suitable salts; provided that

(1) when R_4 is $C(O)R_6$, t-butyl or phenyl substituted with Cl or NO_2, then R_1 is H or C_1–C_4 alkyl and R_1, R_2, and R_3 cannot be s-butyl or isopropyl;

(2) R_1, R_2, R_3 and R_{11} cannot be t-butyl;

(3) in Formula Ia, when R_1 is NO_2, then R_1 cannot be in the 5-position;

(4) in Formula Ia, when R_1 is not in the 5-position, R_2 and R_3 are other than H, and R_1 must be other than H unless both R_2 and R_3 are H;

(5) in Formula Ia, R_3 cannot be Cl or Br;

(6) in Formula Ib, R_1 cannot be $C(O)CCl_3$; and

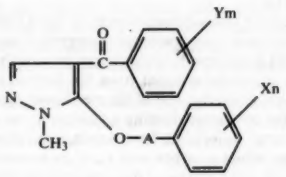
(7) in Formula Ib, when R_3 is Cl or Br, then R_3 is in the 3-position and R_1 cannot be H or C_1–C_4 alkyl.

4,557,753
HERBICIDAL 4-BENZOYL-1-METHYL-5-PHENYLALKOXY PYRAZOLES

Norio Tanaka; Masakazu Taniguchi, both of Funabashi; Masatoshi Baba, Narashino; Takashi Ikai, Tokyo; Tsutomu Nawamaki, Yono, and Masaji Matsunaga, Funabashi, all of Japan, assignors to Nissan Chemical Industries Ltd., Tokyo, Japan

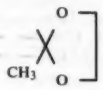
Filed Apr. 18, 1983, Ser. No. 485,832
Claims priority, application Japan, Apr. 24, 1982, 57-69351
Int. Cl.⁴ A01N *43/56;* **C07D** *231/20*
U.S. Cl. 71—92 **23 Claims**

1. A pyrazole derivative of the formula I:



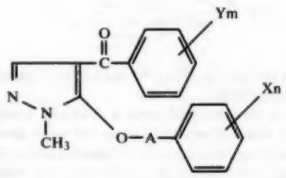
(I)

wherein, A denotes a straight or branched lower alkylene or lower alkylidene group; X denotes a halogen atom, nitro group, a lower alkyl group, a lower haloalkyl group, a lower alkoxy group, a lower haloalkoxy group, a lower alkenyl group, phenyl group, cyano group, phenoxy group, a lower alkoxycarbonyl group, a straight or branched alkanoyl group having 2 to 5 carbon atoms, a benzoyl group, methanesulfonyloxy group or group



and n is 0 or an integer of 1 to 5; said Xs being the same or different when n is an integer of 2 to 5; and Y denotes a halogen atom, a lower alkyl group, nitro group, phenyl group, a lower alkoxy group or trifluoromethyl group and m is an integer of 1 to 3, said Ys being the same or different when m is 2 or 3.

23. A method of damaging and controlling weeds which comprises applying to the weeds or to the locus thereof a herbicidally effective amount of a compound of the formula I:



(I)

wherein, A denotes a straight or branched lower alkylene or lower alkylidene group, X denotes a halogen atom, nitro group, a lower alkyl group, a lower haloalkyl group, a lower alkoxy group, a lower haloalkoxy group, a lower alkenyl group, phenyl group, cyano group, phenoxy group, a lower alkoxycarbonyl group, a straight or branched alkanoyl group having 2 to 5 carbon atoms, a benzoyl group, methanesulfonyloxy group or group

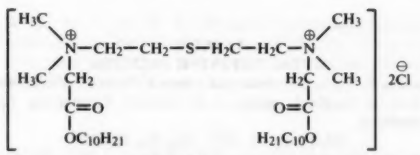
and n is 0 or an integer of 1 to 5, said Xs being the same or different when n is an integer of 2 to 5; and Y denotes a halogen atom, a lower alkyl group, nitro group, phenyl group, a lower alkoxy group or trifluoromethyl group and m is an integer of 1 to 3, said Ys being the same or different when m is 2 or 3.

4,557,754
BIS-(N,N-DIMETHYL-N-CARBODECYLOXYMETHYL-N-ETHYLENE-AMMONIUM)-SULPHIDE DICHLORIDE AND USE THEREOF

Georgy A. Golik; Yaroslav P. Demchenko; Miron O. Lozinsky; Vladlen V. Malovik, and Valery Y. Semeny, all of Kiev, U.S.S.R., assignors to Institut Organicheskoi Khimii, Kiev, U.S.S.R.

Filed Aug. 13, 1980, Ser. No. 177,538
Int. Cl.⁴ A01N *37/44, 33/12;* **A61K** *31/225;* **C07C** *149/243*
U.S. Cl. 71—98 **9 Claims**

1. Bis-(N,N-dimethyl-N-carbodecyloxymethyl-N-ethyleneammonium)-sulphide dichloride of the formula



9. A plant growth regulator characterized in that it comprises bis-(N,N-dimethyl-N-carbodecyloxymethyl-N-ethyleneammonium)-sulphide dichloride as an active principle in an amount of from 0.0001 to 1.0 wt.%, water being the balance.

4,557,755
MICROENCAPSULATED AGRICULTURAL CHEMICAL AND PROCESS OF PREPARATION THEREOF

Masaaki Takahashi, Tokyo; Yuji Hattori, and Yuriko Igarashi, both of Iwaki, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Nihonbashi, Japan

Filed Jul. 23, 1982, Ser. No. 401,241
Claims priority, application Japan, Jan. 18, 1982, 57-6350
The portion of the term of this patent subsequent to Jul. 17, 2001, has been disclaimed.
Int. Cl.⁴ A01N *37/00, 37/18, 25/28;* **B01J** *13/02*
U.S. Cl. 71—100 **10 Claims**

1. A process for preparing a microencapsulated agricultural chemical, comprising

dispersing an agricultural chemical having a solubility of not more than 1 g in 100 ml of water at 20° C. and a vapor pressure of not more than 760 mmHg at 60° C. in an aqueous medium consisting essentially of a water-soluble cationic urea resin, an anionic surfactant selected from the group consisting of salts of aliphatic acids, sulfate esters of higher alcohols, and salts of alkylaryl sulfonic acids and at least one prepolymer formed from formaldehyde and at least one compound selected from the group consisting of urea, melamine, and thiourea, and

maintaining the pH of the obtained dispersion within an acidic range to polycondense the water-soluble cationic urea resin and said prepolymer by adding an acid catalyst.

10. A microencapsulated agricultural chemical produced by the process of claim **1**.

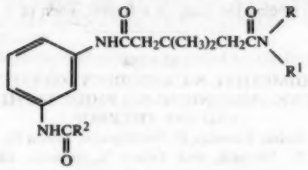
4,557,756

META-ANILIDE AND META-ANILIDE UREA HERBICIDAL COMPOUNDS AND METHODS OF USE

Eugene G. Teach, El Cerrito, and Jeffery T. Springer, El Sobrante, both of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Dec. 30, 1983, Ser. No. 567,282
Int. Cl.[4] C07C 127/19, 103/87
U.S. Cl. 71—118 13 Claims

1. A compound having the structural formula



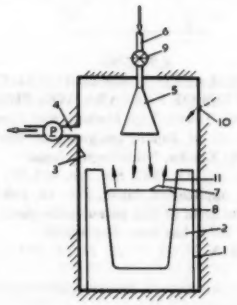
wherein R is selected from the group consisting of hydrogen or C_1–C_3 alkyl; R^1 is selected from the group consisting of C_1–C_3 alkyl; and R^2 is selected from the group consisting of C_1–C_3 alkyl, C_1–C_2 alkylamino, C_2–C_4 dialkylamino, and C_2–C_4 alkylalkoxyamino.

4,557,757

METAL REFINING PROCESS

Thomas R. Dick, Hamilton, and James F. Metcalf, Motherwell, both of Scotland, assignors to Consarc Engineering Ltd., Scotland

Filed May 22, 1984, Ser. No. 613,055
Claims priority, application United Kingdom, May 24, 1983, 8314298
Int. Cl.[4] C21C 5/34, 7/10
U.S. Cl. 75—49 6 Claims



1. A process for the refining of a body of metal having a free surface, which process comprises the steps of melting down the body of metal under substantially sub-atmospheric pressure into a pool of molten metal having a free surface and removing unwanted constituents therefrom in which process there is present an in-leakage of deleterious gas at a predetermined rate wherein the improvement comprises the further step of directing a flow of non-deleterious gas substantially directly towards said free surface of said body of metal at a rate relative to said predetermined in-leakage rate such that said body of metal is maintained under an atmosphere in which the ratio of the partial pressure of non-deleterious gas to the partial pressure of deleterious gas is at least 10:1 during said steps of melting down and removal of unwanted constituents.

4,557,758

STEELMAKING PROCESS

Vladimir G. Mizin, ulitsa Anosova, 6.; Alexei G. Zubarev, ulitsa Pervomaiskaya, 11/133, kv. 50.; Gennady S. Kolganov, ulitsa Kalinina, 26, korpus 2, kv. 307.; Stanislav S. Volkov, ulitsa Volodarskogo, 78, kv. 116.; Jury A. Rudnev, ulitsa Michurina, 130, kv. 112.; Evgeny N. Ivashina, ulitsa Vilyamsa, 2, korpus 2, kv. 341., all of Tula; Konstantin A. Blinov, ulitsa Kosinskaya, 18, korpus 3, kv. 103., and Petr I. Jugov, Malaya Polyanka, 10, kv. 18., both of Moscow, all of U.S.S.R.

PCT No. PCT/SU83/00018, § 371 Date Jul. 19, 1984, § 102(e) Date Jul. 19, 1984, PCT Pub. No. WO84/02353, PCT Pub. Date Jun. 21, 1984
PCT Filed Jun. 2, 1983, Ser. No. 638,481
Claims priority, application U.S.S.R., Dec. 16, 1982, 3518628
Int. Cl.[4] C21C 7/00
U.S. Cl. 75—51.2 6 Claims

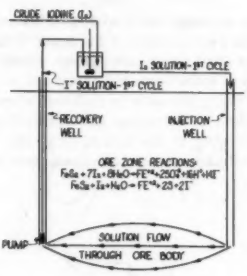
1. In a process for making steel from solid metal iron-bearing charge materials in an iron converter, comprising heating and melting the solid metal iron-bearing charge material by supplying a fuel and an oxidizing agent from the bottom upwardly and from the side through a bed of the metal-bearing materials charged into the converter, feeding oxidizing agent from the top onto the charge materials to form a melt, and subjecting the melt to refining, while a carbon and a silicon containing heat carrier are added in the course of the steel making process, the improvement which comprises; charging the silicon containing heat carrier into the converter at a time corresponding to the time when the solid metal iron-bearing charge materials are completely converted from the solid to a molten state while, simultaneously stopping the supply of the oxidizing agent from the side and from the top, and reducing the supply of the oxidizing agent from the bottom.

4,557,759

IODINE LEACH FOR THE DISSOLUTION OF GOLD

Kent J. McGrew, and Jack W. Murphy, both of Laramie, Wyo., assignors to In-Situ, Inc., Laramie, Wyo.

Filed Apr. 10, 1984, Ser. No. 598,706
Int. Cl.[4] C22B 11/04
U.S. Cl. 75—118 R 14 Claims



1. A process for the recovery of gold from a material containing gold comprising:

(a) contacting the material with a lixiviant comprising a solution in which elemental iodine has been dissolved by means of adding iodine to the lixiviant, passing the lixiviant through ore bearing an iodine-reducing material, allowing the iodine to react with said iodine-reducing material to produce iodine, and subsequently adding more elemental iodine to this same lixiviant whereupon more iodine is dissolved by reaction with iodine, all in the substantial absence of added cations to promote dissolution of the iodine in order to oxidize elemental gold to ionic gold, and to complex the ionic gold, thus maintaining the gold in solution; and

(b) recovering the gold from the pregnant lixiviant.

4,557,760

PROCESS FOR RECOVERING NOBLE METALS BELONGING TO GROUP VIII OF THE PERIODIC SYSTEM OF THE ELEMENTS FROM A CONTAMINATED CATALYST SOLUTION ORIGINATING FROM THE CARBONYLATION OF METHYL ACETATE AND/OR DIMETHYLETHER

Heinz Erpenbach, Cologne; Klaus Gehrmann; Winfried Lork, both of Erftstadt, and Peter Prinz, Hürth, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed May 29, 1984, Ser. No. 614,480

Claims priority, application Fed. Rep. of Germany, Jun. 8, 1983, 3320630

Int. Cl.⁴ C01G *55/00*

U.S. Cl. 75—121 **6 Claims**

1. In the process for recovering noble metals belonging to group VIII of the Periodic System of the elements from a contaminated catalyst solution originating from the carbonylation of methyl acetate, dimethylether or a mixture thereof, the catalyst solution containing carbonyl complexes of these noble metals, at least one substance selected from the group consisting of organic compounds of the nitrogen group and salts of alkali metals, alkaline earth metals, chromium, iron, cobalt or nickel as promoters, and undistillable organic contaminants as well as acetic acid, acetic anhydride and ethylidene diacetate, wherein the volatile constituents are distillatively removed from the catalyst solution and the remaining distillation residue is water-treated whereby the noble metal/carbonyl-complex is precipitated together with the organic contaminants and is separated from the aqueous phase, whilst the promoter is dissolved and recovered, the improvement which comprises: setting free the noble metals in elemental form by subjecting the noble metal/carbonyl-complex separated and contaminated with organic polymers at temperatures of 150° to 300° C. to treatment with an ethyleneglycoldialkylether of the formula $R(—OCH_2—CH_2)_n—OR$, in which n stands for a number of from 1 to 4 and R stands for identical or different alkyl groups having from 1 to 6 carbon atoms, and recovering the noble metals so set free by filtration and, after distillative removal and recovery of the solvent, removing the organic contaminants initially retained in the solvent.

4,557,761

RECORDING LIQUID

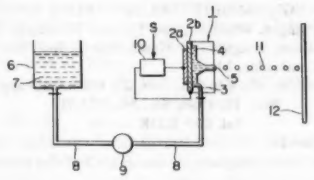
Masatsune Kobayashi, Yokohama; Tsuyoshi Eida, Ichikawa; Shoji Koike; Yasumasa Yokoyama, both of Yokohama, and Tomoko Komori, Machida, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 17, 1983, Ser. No. 552,794

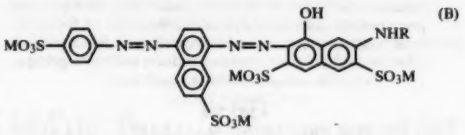
Claims priority, application Japan, Dec. 1, 1982, 57-210906; Dec. 1, 1982, 57-210907

Int. Cl.⁴ C09D *11/02*

U.S. Cl. 106—22 **2 Claims**

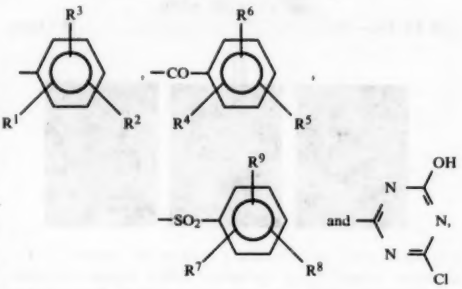


1. A recording liquid for ink-jet recording comprising coloring matter, which is an image-forming component, and a liquid medium for dissolving or dispersing the coloring matter, said recording liquid being characterized by containing at least one of the dyes represented by the following general formula (B), as an image-forming component,



(B)

wherein; R represents one member selected from the group consisting of —$COCH_3$,



R^1, R^2, R^3, R^4, R^5, R^6, R^7, R^8 and R^9 each being a member selected from the group consisting of H, CH_3, C_2H_5, Cl, NH_2, OH and OCH_3; and M represents a base selected from Na, K, Li, NH_4, and amine salt cations.

4,557,762

ELECTROLESS COPPER PLATING SOLUTION

Akishi Nakaso, Oyama; Toshiro Okamura; Kiyoshi Yamanoi, both of Shimodate, and Sumiko Nakajima, Ibaraki, all of Japan, assignors to Hitachi Chemical Company, Tokyo, Japan

Filed Jul. 30, 1984, Ser. No. 635,403

Claims priority, application Japan, Aug. 4, 1983, 58-142686

Int. Cl.⁴ C23C *3/02*

U.S. Cl. 106—1.23 **8 Claims**

1. An electroless copper plating solution comprising:

(a) cupric ions, a complexing agent for cupric ions, a reducing agent and a pH adjuster;

(b) a fluoropolyether of the formula:

$$—(O—\underset{\displaystyle CR_3}{\underset{|}{CR}}—CR_2)_k—(O—CR_2—\underset{\displaystyle CR_3}{\underset{|}{CR}})_m—(O—CR_2)_n—, \text{ or}$$

$$—(O—CR_2—CR_2)_p—(O—CR_2)_q—$$

wherein each R is fluorine, k and m are each zero or a positive number, providing k and m are not zero at the same time; and n, p and q are each a positive number; and

(c) at least one member selected from the group consisting of a cyanide, α,α′-dipyridyl and 1,10-phenanthroline or a derivative thereof.

4,557,763

DISPERSANT AND FLUID LOSS ADDITIVES FOR OIL FIELD CEMENTS

Charles George, and Richard R. Gerke, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed May 30, 1984, Ser. No. 615,394

Int. Cl.⁴ C04B *7/354*

U.S. Cl. 106—90 **19 Claims**

1. A cementing composition useful in cementing oil, gas and water wells comprising:

water;

hydraulic cement; and,

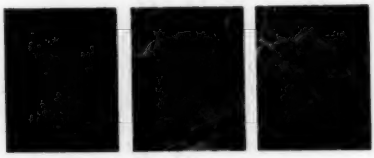
a water-soluble additive consisting essentially of a polymer prepared by caustic-catalyzed condensation of formaldehyde with acetone or a substance derived from acetone, wherein said polymer contains sodium sulfonate groups.

4,557,764

PROCESS FOR PREPARING MALLEABLE COLLAGEN AND THE PRODUCT THEREOF

George Chu, Sunnyvale, Calif., assignor to Collagen Corporation, Palo Alto, Calif.

Filed Sep. 5, 1984, Ser. No. 648,001
Int. Cl.[4] C08L *89/06*
U.S. Cl. 106—161 **18 Claims**



1. A process for preparing a second nucleation collagen which comprises:

(a) mixing at a temperature of about 1°–10° C. a preparation of collagen in solution with a solution effective in rendering the collagen insoluble to give a mixture;

(b) immediately subjecting the mixture to a force of 8,000–13,000×g to give a precipitate of first nucleation collagen and a supernatant fraction;

(c) removing the supernatant fraction and incubating said supernatant fraction at about 15°–25° C. for a period effective to form a precipitate of second nucleation collagen; and

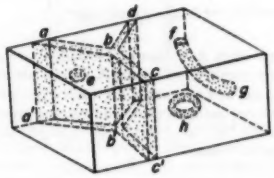
(d) recovering the second nucleation collagen.

4,557,765

METHOD FOR AMORPHIZATION OF A METAL CRYSTAL

Hirotaro Mori, Suita, and Hiroshi Fujita, Ibaraki, both of Japan, assignors to Osaka University, Suita, Japan

Filed Mar. 2, 1984, Ser. No. 585,911
Claims priority, application Japan, Jul. 16, 1983, 58-128710
Int. Cl.[4] C22F *3/00*
U.S. Cl. 148—4 **5 Claims**



1. A method of forming an amorphous metal region at a predetermined position within an intermetallic compound comprising the steps of:

(a) introducing a lattice defect having a given shape at said predetermined position within said intermetallic compound by adjusting the arrangement of the lattice defects, said defect being selected from the group consisting of a dislocation line, stacking fault, crystal grain boundary and foreign interface;

(b) irradiating said intermetallic compound with an electron beam having a flux density not exceeding approximately 1×10^{24} e/m^2. sec, the energy of said electron beam being sufficient to introduce damage to said intermetallic compound, particularly in the vicinity of said lattice defect, in addition to that produced in step (a);

(c) heating said intermetallic compound to a temperature not exceeding approximately 273° K.; and

(d) maintain said electron beam irradiation for a time not exceeding approximately 1300 seconds to cause amorphorization along said lattice defect, said intermetallic compound being selected from the group consisting of NiTi and Co_2Ti.

4,557,766

BULK AMORPHOUS METAL ALLOY OBJECTS AND PROCESS FOR MAKING THE SAME

Michael A. Tenhover; Richard S. Henderson, both of Solon, and Robert K. Grasselli, Aurora, all of Ohio, assignors to Standard Oil Company, Cleveland, Ohio

Filed Mar. 5, 1984, Ser. No. 586,467
Int. Cl.[4] B22F *3/24*
U.S. Cl. 148—11.5 P **13 Claims**

1. A process for the production of substantially amorphous metal alloy objects comprising:

(a) preparing an intimate mixture of the components of the amorphous metal alloy by a solid state reaction, at least one component of the intimate mixture being a ductile component; and

(b) forming the intimate mixture into an object at a temperature below the crystallization temperature of the metal alloy so as to form an amorphous metal alloy object.

4,557,767

FUSIBLE POWDERED METAL PASTE

Jennie S. Hwang, Pepper Pike, Ohio, assignor to SCM Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 546,794, Oct. 31, 1983, abandoned. This application Sep. 11, 1984, Ser. No. 649,493
Int. Cl.[4] B23K *35/34*
U.S. Cl. 148—23 **57 Claims**

1. A nonaqueous noncorrosive inorganic salt free powdered metal soft solder paste composition containing from 75% to 95% by weight of a powdered soft solder metal or powdered soft solder metal alloy having an average particle size finer than 100 mesh (U.S. Standard Sieve Size) and from 5% to 25% by weight of a nonaqueous organic liquid having a surface tension of from 43 to 65 or more dynes/cm. at 20° C., and a noncorrosive anhydrous flux.

4,557,768

NON-HYGROSCOPIC WELDING FLUX BINDERS

Eric A. Barringer, Waltham, and Thomas W. Eagar, Belmont, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Division of Ser. No. 626,613, Jun. 29, 1984. This application Nov. 19, 1984, Ser. No. 673,016
Int. Cl.[4] B23K *35/34*
U.S. Cl. 148—24 **21 Claims**

1. A weld flux comprising a compound of the formula:

$$M_2O.M'O.SiO_2$$

wherein M is selected from the elements in Group I of the Periodic Table,

wherein M' is selected from the elements in Group II of the Periodic Table and

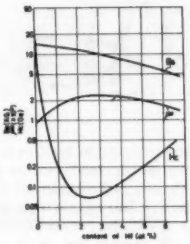
wherein said compound is the reaction product of hydrolyzed, polymerized tetraalkylorthosilicate.

4,557,769

SOFT MAGNETIC MATERIAL

Yutaka Shimada, Sendai; Koichi Mukasa, Niigata; Takashi Hatanai, Niigata, and Keishi Nakashima, Niigata, all of Japan, assignors to Alps Electric Co., Ltd.

Filed Jul. 16, 1984, Ser. No. 630,897
Claims priority, application Japan, Jul. 16, 1983, 58-128712
Int. Cl.[4] H01F *1/04*
U.S. Cl. 148—31.55 3 Claims



1. A soft magnetic material consisting of a cobalt-base ternary amorphous alloy containing hafnium and tantalum, the content of said hafnium being from 1 atom % to 5 atom % and the content of said tantalum being from 4 atom % to 10 atom %.

4,557,770

ALUMINUM BASE ALLOYS

Aldo E. Vidoz, Los Altos Hills; Donald D. Crooks, San Jose; Richard E. Lewis, Saratoga; Ian G. Palmer, Los Altos, and Jeffrey Wadsworth, Menlo Park, all of Calif., assignors to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.

Filed Aug. 8, 1983, Ser. No. 520,896
Int. Cl.[4] C22C *21/00*
U.S. Cl. 148—437 2 Claims

1. Aluminum base alloys consisting essentially of 0.5 to 4.3 weight percent lithium, 0.02 to 20 weight percent beryllium with the remainder being aluminum, said alloys exhibiting a microstructure consisting of an age hardenable, aluminum-lithium matrix having a uniform dispersion of fine beryllium-rich particles of submicron size.

4,557,771

CHARGE LINER FOR HOLLOW EXPLOSIVE CHARGES

Győző Bencz; János Deres, both of Budapest, and Péter Tuti, Érd, all of Hungary, assignors to Országos Kőolaj és Gázipari Tröszt, Budapest and Ès Robbanòanyag Felügyelet, Nagytètènу, both of, Hungary

Filed Mar. 28, 1983, Ser. No. 479,817
Int. Cl.[4] C06B *45/12*
U.S. Cl. 149—14 4 Claims

1. In an explosive charge shaped to define a hole therein and a charge liner bounding the hole and separating the charge from the hole, said charge liner being collapsible by the explosive force of the charge, upon ignition thereof, into a high-velocity jet for piercing a solid target material; the improvement wherein said charge liner contains at least one material selected from the group consisting of a bismuth alloy, a metal mixture with bismuth content, and elementary bismuth; and wherein the bismuth content in said charge liner is between 0.5 and 100%, whereby said charge liner behaves as a nearly ideal fluid in the formation of said high-velocity jet.

4,557,772

PROCESS FOR MAKING STAINED GLASS TIFFANY-TYPE LAMP SHADES

Paul V. Crist, Jr., 4941 N. Camellia Ave., Temple City, Calif. 91780

Filed Sep. 19, 1984, Ser. No. 651,991
Int. Cl.[4] B44C *3/12*
U.S. Cl. 156—62 18 Claims

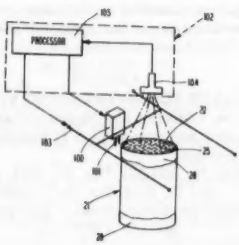
1. A process for making a stained glass lamp shade of a particular design which comprises the following steps: (a) providing a lined drawing of at least a portion of the design to be incorporated into the lamp shade which incorporates circumscribed areas representing the sizes and shapes of pieces of stained glass required to form the design; (b) cutting the lined drawing into separate patterns respectively representing the size and shapes said pieces of stained glass; (c) providing a quantity of stained glass of different colors; (d) cutting the stained glass into selected sizes and shapes by means of said patterns to obtain the required pieces of stained glass to form the design; (e) providing a form corresponding to the shape of the lamp shade to be produced by the process; (f) inscribing lines on the outer surface of the form circumscribing areas corresponding in size and shape to the circumscribed areas of the lined drawing; (g) adhesively attaching the pieces of stained glass to the external surface of the form in respective ones of the circumscribed areas thereon; and (h) attaching the pieces of stained glass to one another.

4,557,773

METHOD FOR SELECTIVELY MANIFOLDING HONEYCOMB STRUCTURES

Roy T. Bonzo, Painted Post, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Jul. 15, 1981, Ser. No. 283,732
Int. Cl.[4] B01D *39/20*
U.S. Cl. 156—64 13 Claims



1. A method for charging a flowable material into ends of a selected plurality of cells of a honeycomb structure having a multiplicity of mutually adjoining cells which are opened at

and extend into the structure from an open surface thereof, comprising the steps of:

forming a solid covering across and onto the open ends of said multiplicity of cells at said open surface;

scanning said covering to locate said plurality of cells;

generating in response to said scanning step first signals indicating the location of said plurality of cells;

generating in response to said first signals second signals for positioning an opening forming means with respect to said plurality of cells;

positioning said opening forming means with respect to said plurality of cells in response to said second signals whereby openings are formed by said means through said covering opposite said plurality of cells; and

charging said flowable material through said openings into said plurality of cells.

4,557,774

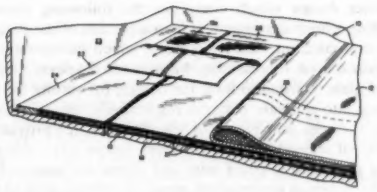
SYSTEM FOR HOLDING CARPET IN PLACE WITHOUT STRETCHING

Merle R. Hoopengardner, Lafayette, Calif., assignor to Jac Tac, Inc., Lafayette, Calif.

Filed Sep. 4, 1984, Ser. No. 647,119

Int. Cl.[4] E04B *2/00*; **E04F** *13/00*; **B32B** *5/14, 7/12*

U.S. Cl. 156—71 **21 Claims**



8. A method of installing a carpet with a carpet cushion, comprising:

positioning a carpet cushion on a floor surface and trimming as required, said carpet cushion having a pressure-sensitive adhesive on its upper and lower surfaces and a removable release film on the pressure-sensitive adhesive on the upper surface, and the carpet cushion including means for maintaining dimensional stability in the carpet cushion;

positioning the carpet on top of the release film on the carpet cushion and cutting and seaming the carpet as required;

folding back the carpet and removing the release film from the exposed area of the carpet cushion;

pressing the carpet down onto the exposed pressure-sensitive adhesive on the upper surface of the carpet cushion;

folding back another portion of the carpet and removing the release film from that area and then pressing that portion of the carpet onto the exposed pressure-sensitive adhesive of the carpet cushion; and

performing final trimming at the carpet edges as required when the entire carpet has contacted the adhesive.

4,557,775

TIE-GUM LAYER FOR RETREADING VEHICLE TIRES

Benny Berggren, Vällingby, and Ninneh Gripenholt, Lidköping, both of Sweden, assignors to Q & Q Retreading System AB, Lidköping, Sweden

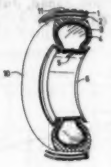
Division of Ser. No. 453,697, Dec. 27, 1982. This application Jan. 13, 1984, Ser. No. 570,647

Claims priority, application Sweden, Jan. 20, 1982, 8200313

Int. Cl.[4] B29H *5/04*

U.S. Cl. 156—96 **4 Claims**

1. An unvulcanized tie-gum layer for vulcanization between a prevulcanized tire carcass and prevulcanized tire tread of a vehicle tire being retreaded, said tie-gum layer including means for maximizing a radially directed component of an electrical field of a microwave energy applicator positioned above the tread wherein in carrying forth a method of retreading a vehicle tire microwave energy emitted by the microwave energy applicator has an electrical field with tangential and radial components, said means for maximizing the radially



directed component cooperating to short circuit the electrical field in the tangential direction of a tread, tie-gum layer and carcass assembly during the retreading of the vehicle tire to heat the tie-gum layer to vulcanization temperature substantially independent of the microwave properties of the tread, tie-gum layer or carcass.

4,557,776

PREPRESSING GLASS PLASTIC ASSEMBLIES

Joseph Chabal, Gibsonia, and Bruce A. Bartrug, Natrona Heights, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 590,101, Mar. 16, 1984, abandoned. This application Jan. 29, 1985, Ser. No. 696,277

Int. Cl.[4] B32B *31/20*

U.S. Cl. 156—103 **12 Claims**

1. A method of preliminarily pressing a laminate assembly of bent glass sheets having a sheet of thermoplastic interlayer material therebetween, comprising:

(1) providing an assembly comprising two bent glass sheets with a sheet of thermoplastic interlayer material in unbonded relation therebetween;

(2) heating said assembly to a first temperature range at which said sheet of interlayer material becomes soft but does not bond to said glass sheets;

(3) biasing selected portions of the marginal edge portion of said bent glass sheets towards one another while said assembly is at said first temperature range to bond said selected portions of said bent glass sheets to said interlayer at said selected portions of said marginal edge portion while remaining unbiased portions of said marginal edge portion of said glass sheets remain unbonded to said interlayer;

(4) discontinuing said biasing step before said biasing step causes permanent optical distortion of said selected portions, to provide a partially marginal edge bonded assembly;

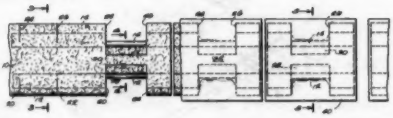
(5) exposing said partially marginal edge bonded assembly to an environment of subatmospheric pressure and elevated temperature greater than said first temperature range before the bonds at said selected portions are broken, to provide a preliminarily pressed assembly.

4,557,777

METHOD OF MAKING FORM FIT DIAPER WITH INSIDE SEAL AND THICKENED CROTCH

Reinhardt N. Sabee, 728 S. Summit St., Appleton, Wis. 54911

Division of Ser. No. 244,442, Mar. 16, 1981, Pat. No. 4,410,324.
This application Sep. 9, 1983, Ser. No. 530,512
Int. Cl.[4] A61F *13/16, 13/18;* B32B *31/18*
U.S. Cl. 156—201 3 Claims



1. A method of making disposable diapers comprising the steps of securing an absorbent pad to spaced plastic ribbons, cutting portions of the pad, folding over the pad upon itself and portions of the ribbon over the pad, applying facing and backing sheets to the pad-ribbon assembly, thereby holding the folded ribbons in place, and cutting the backing and facing sheets to conform to the ribbon-pad configuration.

4,557,778

METHOD AND APPARATUS FOR MANUFACTURING COMPRESSED MATERIALS HAVING TEXTURED SURFACES

Kurt Held, Alte Strasse 1, D-7218 Trossingen 2, Fed. Rep. of Germany

Filed Dec. 15, 1983, Ser. No. 561,690
Claims priority, application Fed. Rep. of Germany, Dec. 21, 1982, 32471467
Int. Cl.[4] B32B *31/12*
U.S. Cl. 156—209 20 Claims

1. A process for the manufacture of paper webs for use in the production of laminate materials having embossed surfaces comprising the steps of feeding together a pair of resin impregnated paper webs, feeding to between said webs a metallic carrier member consisting of a hard wear resistant material having two opposed surfaces with an embossing pattern on each of said opposed surfaces to form a layered structure consisting of said carrier member with said webs being applied one against each of said opposed surfaces thereof, compressing said layered structure by applying pressure on each of said webs from both sides of said carrier member, heating said layered structure, subsequently cooling said layered structure, roughening the outer sides of said paper webs and separating said paper webs from said carrier member.

6. Apparatus for the manufacture of laminate materials having embossed surfaces comprising an unwinding unit including supply rolls for feeding together a pair of resin impregnated paper webs, means including carrier rolls for feeding to between said webs a metallic carrier member having a hard wear resistant surface with an embossing pattern thereon to form a layered structure consisting of said carrier member with said webs on opposite sides thereof, a laminating machine for compressing said layered structure while applying pressure and heat thereto, a spray water cooling device for cooling said layered structure after passage thereof through said laminating machine, a grinding station located downstream of said spray water cooling device for roughening the outer sides of said paper webs, a winding station including rolls for winding thereon said paper webs after passage through said grinding station, a panel cutting station for cutting said paper webs to a desired size, a control cabinet including a data viewer for enabling control of said apparatus and for viewing information indicative of the operating parameters thereof, a carrier member takeup coil for having wound thereon said carrier member after removal thereof from between said webs, said carrier rolls and said takeup coil being arranged to permit forward and backward spooling of said carrier member to enable selective positioning thereof relative to said paper webs.

4,557,779

METHOD OF FORMING AN EMBOSSING CAUL

Richard K. Bower, New Milford, Conn., and Stephen J. Tellman, Patterson, N.Y., assignors to Champion International Corporation, Stamford, Conn.

Continuation of Ser. No. 192,851, Oct. 1, 1980, abandoned, which is a continuation-in-part of Ser. No. 923,494, Jul. 11, 1978, abandoned. This application Jul. 6, 1984, Ser. No. 628,953
Int. Cl.[4] B32B *31/00*
U.S. Cl. 156—219 13 Claims

1. A method for forming a plastic embossing caul consisting of the essential the steps of:

(a) sealing a textured wood panel by applying at least one coat of a sealer to the surface of said panel;

(b) providing said sealed panel with a release agent;

(c) placing an assembly consisting of said sealed panel, a backing panel, and a plurality of high temperature resin ion-cellulosic prepreg plies each including a heat insensitive web in a hot press, said prepreg plies being disposed between the two panels;

(d) compressing said assembly under heat and pressure conditions until the prepreg plies form a laminated caul which is substantially cured and has assumed the relief configuration of the textured wood panel;

(e) removing the assembly from the hot press; and

(f) separating the sealed panel and backing panel from the caul, whereby the configuration of the textured wood panel assumed by the caul is permanently maintained and usable as an embossed wood panel grain pattern.

4,557,780

METHOD OF MAKING AN ORIENTED POLYMERIC FILM

David L. Newsome, Neenah; Arnold R. Rein, Menasha; Bradley J. Hoss, Neenah, and George O. Schroeder, Appleton, all of Wis., assignors to American Can Company, Greenwich, Conn.

Filed Oct. 14, 1983, Ser. No. 542,031
Int. Cl.[4] B29D *7/02*
U.S. Cl. 156—244.11 23 Claims

1. A method of making a five layer oriented polymeric film, said method comprising the steps of:

(a) coextruding a five layer film having a first barrier layer, the composition of said first layer being 10% to 50% nylon or nylon copolymer and 90% to 50% ethylene vinyl alcohol, said first layer having two opposing surfaces; second and third adhesive layers adhered to said surfaces of said first layer, said second and third adhesive layers both comprising olefinic polymers or copolymers having carboxyl modifications thereto; and fourth and fifth layers adhered to said second and third layers on the respective surfaces opposite said first layer, said fourth and fifth layers comprising 40%

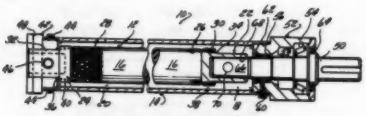
to 100% ethylene vinyl acetate and 60% to 0% linear low density polyethylene;
(b) cooling said five layer film;
(c) reheating said five layer film to molecular orientation temperatures;
(d) molecularly orienting said five layer film; and
(e) cooling said molecularly oriented five layer film;
said oriented film being susceptible to being made into a closed and sealed container by means of heat seals formed along terminal edges of adjacent superimposed sheets thereof.

4,557,781

ELASTOMERIC MEMBER AND METHOD OF MANUFACTURE THEREFOR

Lyle O. Hoppie, Birmingham, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Division of Ser. No. 469,619, Feb. 25, 1983, Pat. No. 4,532,163. This application Mar. 6, 1985, Ser. No. 710,739
Int. Cl.[4] B29C *19/00*
U.S. Cl. 156—245 **2 Claims**



1. A method of manufacturing a generally cylindrical elastomeric member assembly adapted to be stretched to a final radius equal to r_f comprising the steps of:
forming a generally cylindrical elastomeric member having a uniform diameter body section and transition sections at each end of reducing diameter;
fabricating a sleeve of wire mesh composed of helically wound crossing wire strands of constant pitch angle wherein the tangent of said pitch angle equals $\lambda + 1/\lambda$, and having a final radius of r_f, a length of z_{fTot} equal to

$$z_{fTot} = \sqrt{\frac{\lambda}{2\lambda+1}}\, r_f \int_0^{\pi/2} \frac{dy}{\left(1-\frac{\lambda-1}{\lambda}\sin^2 y\right)\left(1-\frac{\lambda-1}{2\lambda+1}\sin^2 y\right)^{\frac{1}{2}}}$$

where λ is the ratio of the length of the body section after stretching to the relaxed length;
forming a pair of rigid end pieces of radius r_f;
securing one end of each wire mesh sleeve to a respective end piece;
securing each wire mesh sleeve over a respective transition section with said elastomeric member in the relaxed state by deforming the free end; and
shaping the profile of each of said transition sections and its respective overlying wire mesh sleeve to the following profile

$$z_l = \sqrt{\frac{\lambda}{2\lambda+1}}\, r_f \int_0^{x} \frac{dy}{\left(1-\frac{\lambda-1}{2\lambda+1}\sin^2 y\right)^{\frac{1}{2}}}$$

$$x = \sin^{-1}\left(\frac{\lambda}{\lambda-1}\,\frac{f^2-1}{f^2}\right)^{\frac{1}{2}}$$

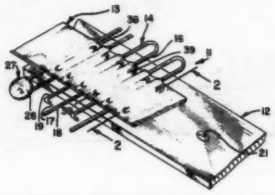
and where z_l is the axial coordinate for values of f between 1 and $\lambda^{\frac{1}{2}}$.

4,557,782

METHODS OF SECURING AN ADHESIVE STRIP TO A CARRIER

Robert R. Swanson, Clemmons, N.C., assignor to AT&T Technologies, Inc., Berkeley Heights, N.J.

Filed Nov. 10, 1983, Ser. No. 550,699
Int. Cl.[4] B32B *31/18*
U.S. Cl. 156—250 **4 Claims**



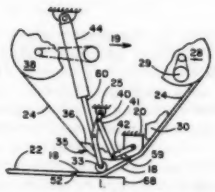
1. A method of producing an article-carrier assembly which includes a strip having an adhesive surface, a carrier formed from a compressible material and at least one article, which comprises the sequential steps of:
placing the article onto one surface of the carrier:
placing the adhesive surface of the strip into engagement with at least a portion of the article and one surface of the carrier:
pressing the strip toward the carrier to secure the strip with the carrier with the article there between:
forming at least one tab in a selected portion of the strip adjacent to the article:
forming at least one pocket in a selected portion of the compressible carrier; and pressing the tab into the pocket.

4,557,783

COMPOSITE TAPE LAYING MACHINE AND METHOD

Robert J. Grone, Elsmere, Ky.; Leonard R. Schnell, Okeana, and Wayne L. Vearil, Milford, both of Ohio, assignors to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Dec. 5, 1983, Ser. No. 557,910
Int. Cl.[4] B29C *27/22*; B65H *17/46*; B32B *31/00*
U.S. Cl. 156—257 **20 Claims**



1. A machine for compacting onto a mold composite tape from a tape assembly that includes said tape removably adhered to a backing comprising
a support assembly;
a supply reel on said support;
a storage reel means supported on said assembly;
a first compaction means;
means for supporting said first compaction means at the lowermost portion of said assembly;
a forward guide disposed between said supply reel means and said first compaction means;
a second compaction means supported at a location between said first compaction means and said storage reel means for compacting tape only against the mold that has been received from said supply reel;
a storage guide disposed between said second compaction means and said storage reel means for directing backing and

discarded tape thereon to said storage reel means when said second compacting means is compacting only tape; and

at least one of said compaction means being supported for movement relative to said support assembly; and

power means to move at said one of said first and second compaction means relative to at least one of said support and the other compaction means so that said second compaction means is compacting only tape and said first compaction means has been removed from compacting engagement to said tape assembly.

4,557,784

CONTINUOUS PROCESS FOR PRODUCING A METAL CLAD LAMINATE

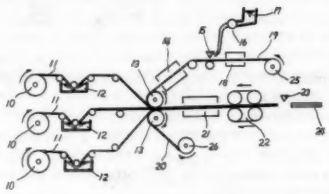
Masakazu Uekita, Kobe; Yasuo Fushiki, Takatsuki, and Masayuki Ooizumi, Kobe, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jun. 27, 1980, Ser. No. 163,695

Claims priority, application Japan, Jun. 29, 1979, 54-83239

Int. Cl.⁴ C09J *5/02*

U.S. Cl. 156—307.7 **2 Claims**



1. In a continuous process for producing a metal clad laminate comprising the steps of impregnating a plurality of fibrous substrates with a curable liquid unsaturated polyester resin, combining the resin-impregnated substrate together and simultaneously laminating a metal foil onto at least one side of the combined substrates, and curing the resulting laminate, the improvement comprising the steps of:

(a) continuously applying a composition consisting essentially of a curable liquid epoxy resin adhesive containing an amine or amide type curing agent onto the side of said metal foil which faces the combined substrates in the finished laminate to form a film;

(b) interposing an additional layer of a compound having a copolymerizable unsaturated bond and an epoxy group in the molecule at the interface between the resin-impregnated substrate and the adhesive film; and

(c) continuously heating said film in situ to remove solvent and gas bubbles present in the adhesive film and to precure said film sufficiently to prevent the adverse effects of low molecular weight components diffusing from the curable resin layer into the adhesive layer immediately prior continuously laminating said metal foil.

4,557,785

APPARATUS FOR WET PROCESSING

Yuji Ohkuma, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 27, 1984, Ser. No. 625,155

Claims priority, application Japan, Jun. 29, 1983, 58-117364

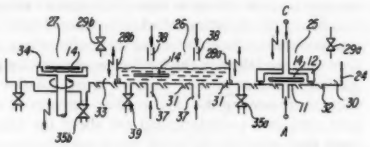
Int. Cl.⁴ H01L *21/306;* C23F *1/00;* B44C *1/22;* C03C *15/00*

U.S. Cl. 156—345 **11 Claims**

1. A wet processing apparatus for a planar substrate, said apparatus comprising a processing chamber, wherein said substrate is processed in said processing chamber, said processing chamber comprising a pedestal and a lid which covers said pedestal, said pedestal and lid defining said processing chamber therebetween, and a plurality of opening means through which streams of a processing liquid are injected, said substrate being floated and rotated by said streams of processing liquid wherein said opening means comprises:

a first opening provided at the center of said pedestal, wherein the processing liquid is injected into said processing chamber through said first opening;

a plurality of nozzles positioned around said first opening, wherein said nozzles are inclined with respect to said substrate such that the processing liquid flowing therethrough rotates said substrate; and



a trench, through which the processing liquid is supplied to each of said nozzles, said trench having a second opening through which the processing liquid is supplied, and wherein said lid comprises:

a third opening through which the processing liquid is injected into said processing chamber; and

exhaust openings arranged on the periphery of said lid through which the processing liquid overflows.

4,557,786

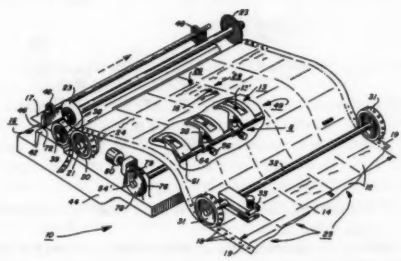
LABEL SCANNER ASSEMBLY FOR LABELLING MACHINES

Robert A. Stock, Crystal Lake, and Robert A. Hayskar, Palatine, both of Ill., assignors to Xerox Corporation, Stamford, Conn.

Filed May 29, 1984, Ser. No. 615,006

Int. Cl.⁴ G01N *21/48*

U.S. Cl. 156—350 **7 Claims**



1. In a labelling machine for processing an endless multi-row label form, said machine including a frame member and label transport means on said frame member for advancing said label form along a predetermined path, the combination of:

a cross shaft rotatably mounted on said frame member, the axis of said cross shaft being substantially perpendicular to the direction of movement of said label form along said path, said cross shaft being spaced from said label transport means;

plural label support arms, there being one label support arm for each label row, each of said support arms being enlarged at one end to provide a label guiding surface;

mounting means for mounting the opposite ends of said support arms on said cross shaft in predetermined spaced axial relation to one another so that said support arms project radially outwardly from said cross shaft with said support arm label guiding surfaces positioned to engage individual ones of said label rows as said label form is advanced along said path by said transport means, said

mounting means coupling said plural support arms with said cross shaft for concurrent rotation;

a sensor on each of said support arms in predetermined spaced relation to the support arm label guiding surface for scanning the labels in the label row engaged by the label guiding surfaces of said support arms as said label form is advanced along said path and across said label guiding surfaces; and

means to rotate said cross shaft together with said plural support arms in unison to move said sensors along an axis parallel to the direction of advance of said label form by said transport means and adjust the point where said sensors scan the labels in the label row engaged by the label guiding surfaces of said support arms, rotation of said cross shaft moving the label guiding surfaces of said support arms in a predetermined arc about the axis of said cross shaft whereby the point where said sensors scan said labels may be adjusted without changing the gap between the labels and said sensors or the predetermined axial distance between adjoining support arms.

4,557,787

AUTOMATICALLY CONTROLLED THERMO-CEMENTING AND FOLDING MACHINE

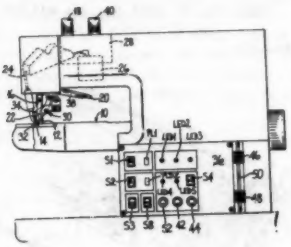
Graham J. Mansfield; Dennis S. Hall, and Ewen R. Cameron, all of Leicester, England, assignors to USM Corporation, Farmington, Conn.

Filed Nov. 23, 1983, Ser. No. 554,558

Claims priority, application United Kingdom, Nov. 24, 1982, 8233504

Int. Cl.⁴ B05C *5/00*

U.S. Cl. 156—356 **10 Claims**



1. A thermo-cementing and folding machine comprising

a main drive shaft,

folding instrumentalities arranged at an operating locality of the machine and including a creaser foot over which a marginal portion of a workpiece can be turned,

workpiece feeding means operable in timed relation with rotation of the main drive shaft for intermittently feeding a predefined length of the workpiece through the operating locality, and

means for varying the predefined length of workpiece being fed, without varying the speed of rotation of the main drive shaft, and

adhesive supply means by which adhesive can be supplied, through a passage in the creaser foot, to the marginal portion of the workpiece being turned thereover wherein the adhesive supply means comprises a gear pump driven by an n.c. motor in response to drive signals which are supplied thereto in timed relation with the rotation of the main drive shaft, but the incidence of which is modified according to the operational state of the means for varying the predefined length of workpiece being fed whereby the rate at which adhesive is supplied to the workpiece marginal portion can be modified in response to variation in the predefined length of workpiece being fed.

4,557,788

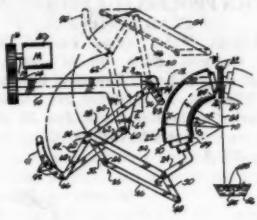
FILAMENT WINDING OF PLASTIC ARTICLES

William R. Dana, Corona del Mar; Ralph S. Friedrich, Hermosa Beach, and John D. McKenney, South Laguna, all of Calif., assignors to Ameron, Inc., Monterey Park, Calif.

Continuation of Ser. No. 460,317, Jan. 24, 1983, abandoned, which is a division of Ser. No. 319,575, Nov. 9, 1981, Pat. No. 4,384,913, which is a division of Ser. No. 78,887, Sep. 25, 1979, Pat. No. 4,323,408. This application Jul. 6, 1984, Ser. No. 626,602

Int. Cl.⁴ B65H *81/00*

U.S. Cl. 156—425 **4 Claims**



1. Apparatus for forming a filament-reinforced plastic article, the apparatus comprising:

a mandrel having a nonlinear longitudinal axis;

means for rotating the mandrel about a winding axis;

a pair of guide fingers adjacent the mandrel, the guide fingers being spaced from each other along the longitudinal axis of the mandrel,

each guide finger being disposed along a respective arc at least part way around the winding axis;

means for feeding resin-coated filaments between the fingers to wrap around the mandrel at a winding station as the mandrel rotates; and

means keeping the distance between the fingers and mandrel axis at the winding station substantially constant and for moving the fingers and mandrel relative to each other back and forth along the mandrel nonlinear longitudinal axis so the filaments slide longitudinally with respect to the filament axes first over one of the fingers and then over the other to wrap the mandrel along its length and form the article, the resin-coated filaments being unrestricted from lateral movement in a plane substantially parallel to the pair of guide fingers for a sufficient distance to leave the filaments free to slide laterally on the guide fingers as the mandrel rotates about the winding axis and follow a stable path on the mandrel.

4,557,789

SPLICING APPARATUS AND CASSETTE THEREFOR

Stephen Collins, 5 Templar St., London SE5, England

Filed Mar. 1, 1982, Ser. No. 353,527

Claims priority, application United Kingdom, Mar. 14, 1981, 8108095

Int. Cl.⁴ B31F *5/00*; B32B *31/04*; B44C *1/00*; B65H *1/00*

U.S. Cl. 156—505 **16 Claims**

8. Splicing apparatus for joining material, such as magnetic recording tape, consisting essentially of:

a support;

two pivotally mounted cutting plates carried by said support and having co-operating cutting edges;

means for defining aligned grooves within said plates formed respectively transversely of the cutting edges thereof for reception of the material to be jointed at a splicing region;

a detachable cassette for storing adhesive items supported on a support carrier strip;

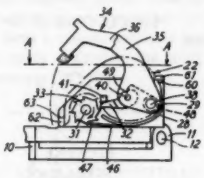
retaining means for holding said cassette in said apparatus;

transport means for driving said carrier, said detachable cassette comprising a housing;

a chamber provided in said cassette housing for receiving the carrier strip in roll form;

means within said cassette housing defining a delivery passage of elongate section through which the carrier strip emerges during use;

means integral with said housing defining an edge adjacent the cassette delivery passage exit against which the carrier strip can be drawn when driven by said transport means



whereby the adhesive items are separated from the support carrier strip; and

wherein the housing of said detachable cassette includes a curved portion adjacent the delivery passage exit, a curvature thereof being transverse of the direction of movement of said carrier strip so as to present a pressure differential to the emerging support carrier and adhesive items on separation from said carrier strip, to aid dispensing of the adhesive item directly over the splicing region.

4,557,790

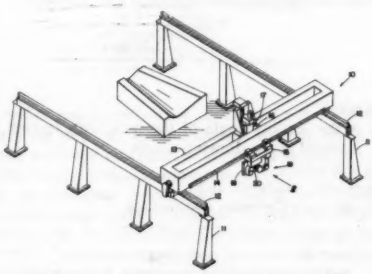
TAPE LAMINATOR

Jerry D. Wisbey, Cincinnati, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Jul. 12, 1984, Ser. No. 630,121

Int. Cl.[4] B32B *31/00*

U.S. Cl. 156—511 **9 Claims**



1. A tape laying machine, comprising in combination:

(a) a machine base having a substantially horizontal base way system defining an X-direction of travel;

(b) a gantry supported on said base way system and having a substantially horizontal gantry way system defining a Y-direction of travel;

(c) a saddle supported on said gantry way system and having a substantially vertical saddle way system defining a Z-direction of travel;

(d) a vertical slide supported on said saddle way system and having a rotary way system defining a rotary C-axis of movement;

(e) a tape head base mounted to said rotary way system;

(f) drive means for moving said tape head base in X, Y, Z, and C directions;

(g) a tape laminator affixed to said tape head base, comprising:

(1) a housing;

(2) a carrier sheet movable with respect to said housing;

(3) means for spacing a plurality of relatively thick strips of compressible material from one another and depositing said spaced strips on said carrier sheet;

(4) means for cutting said strips to predetermined lengths; and

(5) means for compressing said strips on said carrier sheet to form relatively thin widened strips which are contiguous to one another, creating a unitary wide tape;

(h) means for advancing said carrier sheet and said wide tape to a tape laydown station defined on said tape head;

(i) means for depositing said wide tape on a designated work surface relatively located at said tape laydown station; and

(j) means for transporting said carrier sheet from said tape laydown station after depositing said tape.

4,557,791

BELT PRESS WITH UPPER AND LOWER BEND COMPENSATORS

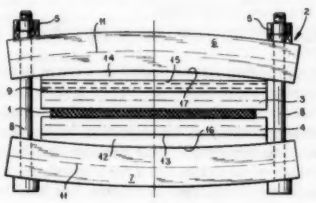
Harald Fudickar, Wuppertal, and Peter Thies, Ennepetal, both of Fed. Rep. of Germany, assignors to Wagener Schwelm GmbH & Co., Schwelm, Fed. Rep. of Germany

Filed Jun. 8, 1984, Ser. No. 618,502

Claims priority, application Fed. Rep. of Germany, Jun. 9, 1983, 3320783

Int. Cl.[4] B30B *15/06*

U.S. Cl. 156—580 **4 Claims**



1. A belt press formed of a longitudinal row of upright and abutting press frames each comprising:

a plurality of upper and a plurality of lower traverses respectively having lower and upper traverse faces;

upper and lower press platens carried on and between the respective traverses and having respective upper and lower platen faces respectively confronting the lower and upper traverse faces, whereby a belt to be pressed can be engaged between the platens;

a lower bend-compensating element operatively engaged between the lower face of the lower platen and the respective confronting upper face of the lower traverse;

an upper bend-compensating element operatively engaged between the upper face of the upper platen and the respective confronting lower face of the upper traverse, the bend-compensating elements each having in unstressed condition a planar element surface operatively flatly engaging the respective platen face and a curved surface engaging the respective traverse face generally in line contact;

a hydraulic force transmitter engaged between one of the platens and the planar element surface of the respective bend-compensating element; and

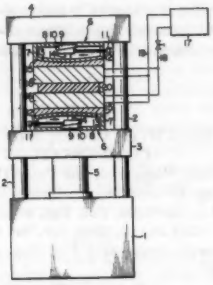
mechanically actuated means including bolts engaged between the traverses for displacing the traverses toward each other and thereby pressing the platens against a belt engaged therebetween with a pressure sufficient to deform the lower traverse, the bend-compensating elements being shaped such that the respective platens remain planar and in direct contact through the respective bend-compensating elements with the respective traverses.

4,557,792

HOT PRESS

Osamu Yamada; Hideyasu Murooka, both of Yokohama; Kaoru Ono, Hadano, and Akimi Miyashita, Toride, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 16, 1984, Ser. No. 600,956
Claims priority, application Japan, Apr. 15, 1983, 58-65574
Int. Cl.[4] B30B *15/34*
U.S. Cl. 156—583.1 6 Claims



1. A hot press comprising:

a pair of bolsters comprising an upper bolster and a lower bolster;

a pair of heating plates located in a space defined between opposing surfaces of the upper bolster and the lower bolster and each being maintained in contact with the opposing surface of the respective bolster through a heat insulating member, so that pressure can be applied to a plurality of substrates and a plurality of prepregs arranged alternately in superposed relation and held between surfaces of the pair of heating plates opposite the surfaces thereof adjacent the heat insulating members while heating them to provide a multilayer printed circuit board; and

plate thickness adjusting means interposed between one of the bolsters and the heat insulating member associated therewith to compress the heat insulating member, comprising a hollow housing including a top plate and a bottom plate, a hydraulic cylinder connected to the top plate and the bottom plate of the housing, and a pressurized fluid supply source connected to said hydraulic cylinder to supply a pressurized fluid thereto.

3. A hot press comprising:

a pair of bolsters comprising an upper bolster and a lower bolster;

a pair of heating plates located in a space defined between opposing surfaces of the upper bolster and the lower bolster and each being maintained in contact with the opposing surface of the respective bolster through a heat insulating member, so that pressure can be applied to a plurality of substrates and a plurality of prepregs arranged alternately in superposed relation and held between surfaces of the pair of heating plates opposite the surfaces thereof adjacent the heat insulating members while heating them to provide a multilayer printed circuit board; and

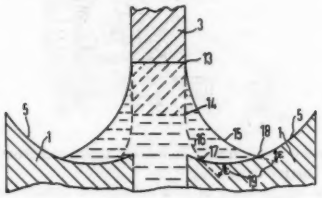
plate thickness adjusting means interposed between one of the bolsters and the heat insulating member associated therewith to compress the heat insulating member, comprising a hollow housing including a top plate and a bottom plate, a wedge secured to the bottom plate, a push rod secured to the top plate located in face-to-face relation to the wedge, another wedge slidably arranged between said first mentioned wedge and push rod, and a moving mechanism for moving the last mentioned wedge.

4,557,793

METHOD AND APPARATUS FOR DRAWING CRYSTALLINE BODIES FROM A MELT

Helmut Foell, Munich; Josef Grabmaier, Berg, and Juergen Schneider, Baldham, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jan. 25, 1984, Ser. No. 573,729
Claims priority, application Fed. Rep. of Germany, Mar. 24, 1983, 3310815
Int. Cl.[4] C30B *15/34*
U.S. Cl. 156—608 8 Claims



1. In a method for drawing crystalline bodies from a melt by means of an open-ended drawing nozzle which determines the cross-sectional geometry of the crystalline body to be drawn, said drawing nozzle being composed of material resistant to said melt, the feed of melt proceeding from a reservoir situated at the lower end of said drawing nozzle and being conveyed to the upper opening thereof by capillary action, the improvement which comprises:

employing a drawing nozzle having an upper opening merging into a contoured surface such that the meniscus formed at the interface between the crystalline and molten phases is freely displaceable on said contoured surface into which said upper opening discharges, the contoured surface having a contour defined by the equation:

$$x = \cos\psi + \sin\epsilon \cdot \ln \frac{1 + \sin(\psi + \epsilon)}{\cos(\psi + \epsilon)}$$

where:

ϵ is the wetting angle of the melt with respect to the material of the drawing nozzle

ψ is arc sin y

meniscus radius = 1, and

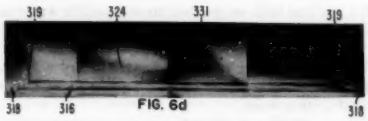
x and y are Cartesian coordinates.

4,557,794

METHOD FOR FORMING A VOID-FREE MONOCRYSTALLINE EPITAXIAL LAYER ON A MASK

Joseph T. McGinn, Raritan Township, Hunterdon County; Lubomir L. Jastrzebski, Plainsboro, and John F. Corboy, Jr., East Amwell Township, Hunterdon County, N.J., assignors to RCA Corporation, Princeton, N.J.

Filed May 7, 1984, Ser. No. 609,504
Int. Cl.[4] C30B *25/04*
U.S. Cl. 156—612 4 Claims



1. A method for forming a layer of monocrystalline diamond cubic material on a mask, comprising:

providing a substrate having a monocrystalline surface parallel to a {100}-type crystallographic plane;

forming a mask on the substrate, the mask including at least two apertures, each aperture including an edge which is oriented between 8° and 14° from a particular <001> direction on the surface, the edges being mutually parallel and in mutual opposition and the apertures each exposing a monocrystalline surface portion of the substrate; and

epitaxially growing diamond cubic material through the apertures and laterally, perpendicular to said aperture edges, so as to form a monocrystalline layer of substantially uniform quality overlying the mask between the edges of the apertures.

4,557,795

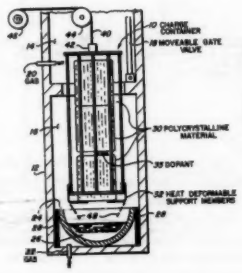
MELT RECHARGE METHOD

Robert W. Helda, deceased, late of Scottsdale; by Cynthia Halextine, personal representative, Pheonix, and H. Ming Liaw, Scottsdale, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Division of Ser. No. 130,913, Mar. 17, 1980, Pat. No. 4,394,352. This application Nov. 15, 1982, Ser. No. 441,882

Int. Cl.⁴ C30B *15/02*

U.S. Cl. 156—617 SP **2 Claims**



1. A self-activated method for recharging a furnace which comprises the steps of: loading charge material into a container, the weight of said material supported in said container by support members rigid at room temperature and characterized by an annealing temperature; placing said container loaded with charge material into said furnace; heating said support members to a temperature in excess of said annealing temperature of said support members to cause said members to soften and release said charge material.

4,557,796

METHOD OF DRY COPPER ETCHING AND ITS IMPLEMENTATION

Frank Druschke, Stuttgart; Georg Kraus, Wildberg; Ulrich Kuenzel, Kusterdingen; Wolf D. Ruh, Sindelfingen, and Rolf Schaefer, Gaertringen-Rohrau, all of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 1, 1984, Ser. No. 636,660

Claims priority, application European Pat. Off., Aug. 2, 1983, 83107604.7

Int. Cl.⁴ C23F *1/02*; B44C *1/22*; C03C *15/00, 25/06*

U.S. Cl. 156—643 **13 Claims**

1. Method of copper dry etching in a glow discharge containing organic compounds, characterized in that compounds with at least one methyl or methylene group are used for etching.

4,557,797

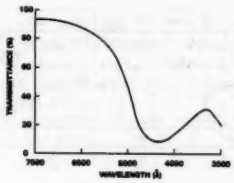
RESIST PROCESS USING ANTI-REFLECTIVE COATING

Gene E. Fuller, Richardson, Tex., and Yi-Ching Lin, Milipitas, Calif., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 1, 1984, Ser. No. 616,344

Int. Cl.⁴ B44C *1/22*; C03C *15/00, 25/06*; C23F *1/02*

U.S. Cl. 156—643 **61 Claims**



20. An integrated circuit selective etching process comprising the steps of:

providing a substrate having partially formed integrated circuit structures on the top surface thereof;

depositing a first photoresist material over the top surface of said substrate, said first photoresist material being deposited to provide a substantially planar surface;

depositing an anti-reflective coating over said first photoresist material; and

depositing a second photoresist material over said anti-reflective material;

wherein said first photoresist material is photosensitive at a first wavelength to which said second photoresist material is opaque,

and wherein said anti-reflective material is opaque at a second wavelength to which said second photoresist layer is sensitive;

exposing said second photoresist material to patterned optical illumination at said second wavelength in a predetermined pattern;

developing said second photoresist material, so that said second photoresist material is removed in areas determined by said predetermined pattern;

illuminating said first photoresist material at said first wavelength;

developing said first photoresist; and

exposing said integrated circuit structure to a predetermined etchant, whereby portions of said top layer exposed by said first photoresist layer are etched and portions of said top layer which are overlaid by remaining portions of said first photoresist layer are not substantially etched.

4,557,798

TELEVISION TUBE WITH OPTIONAL SHADOW MASK AND METHOD OF MANUFACTURE

Wendell S. Blanding, Painted Post, N.Y.; Ronald E. Johnson, Tioga, Pa., and Robert V. Van Dewoestine, Corning, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Sep. 29, 1982, Ser. No. 427,514

Int. Cl.⁴ B44C *1/14*; B32B *31/00*; C03C *15/00*; B41C *1/06*

U.S. Cl. 156—660 **5 Claims**

1. A method of producing a colored TV bulb including a panel and an aperture mask, with said panel having a composite of a black matrix pattern and respective red, blue and green color phosphor patterns deposited thereon, comprising the steps of:

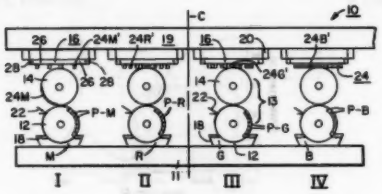
formulating separate thermoplastic ink compositions for each of the black matrix and color phosphors, said inks exhibiting cohesive strength and pressure sensitivity at near room temperature;

forming each composition into a corresponding separate pattern;

establishing the black matrix and respective color phosphors in separate ink patterns on separate carriers from the separate inks;

completely transferring the separate patterns onto at least one collector and registerably combining said separate patterns into the composite on such collector;

completely transferring the composite from the collector to the panel;



forming a metal sheet into a desired shape having a shadow mask portion;

printing opposite sides of the shadow mask portion with an acid resist material in a desired aperture pattern;

acid etching the mask portion for producing apertures in said mask portion not covered by the acid resist material;

and forming an aperture mask which is interchangeable with a panel having said composite so formed thereon.

4,557,799

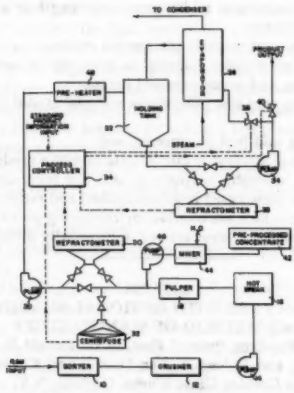
TOMATO CONSISTENCY CONTROL APPARATUS

Philip E. Nelson, West Lafayette, Ind., and Norihisa Takada, Gumma, Japan, assignors to Purdue Research Foundation, West Lafayette, Ind.

Division of Ser. No. 417,184, Dec. 2, 1981, Pat. No. 4,437,934. This application Feb. 21, 1983, Ser. No. 565,836

Int. Cl.⁴ B01D *1/00*; A23L *1/212*

U.S. Cl. 159—44 **7 Claims**



1. Apparatus for controlling a concentrator during the manufacture of tomato products to an established consistency standard, the concentrator comprising an input for receiving tomato feedstock including means for introducing feedstock into the input, means for circulating the material within the concentrator, and an output including valve means for releasing material from the concentrator, the control means comprising: first measuring means connected to the feedstock input of the concentrator for measuring the initial precipitate weight ratio of a tomato feedstock, second measuring means connected adjacent the first measuring means for measuring the initial Brix level of the tomato feedstock, said control means also including (a) input means operatively connected for receiving measurements from said first and second measuring means, (b), first computing means for computing the expected precipitate weight ratio of a tomato product selected for manufacture and (c) second computing means for computing an expected Brix level of the tomato product, final measuring means connected to the concentrator for measuring the Brix level of the material therein, comparing means for comparing the expected Brix level as computed by the second computing means with the Brix level as measured by the final measuring means, and means connecting the comparing means to the valve means of the concentrator output for controlling the operative condition of the valve means in response to the comparison made by the comparison means to effect release of tomato product from the concentrator.

4,557,800

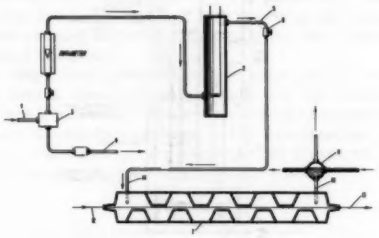
PROCESS OF FORMING A POROUS CELLULOSIC PAPER FROM A THERMAL TREATED CELLULOSIC NON-BONDING PULP

Homan B. Kinsley, Jr., Powhatan, Va., assignor to James River Corporation, Richmond, Va.

Continuation of Ser. No. 385,093, Jun. 4, 1982, abandoned, which is a continuation of Ser. No. 204,173, Nov. 5, 1980, abandoned. This application Nov. 20, 1984, Ser. No. 674,346

Int. Cl.⁴ D21C *1/02, 9/00*

U.S. Cl. 162—20 **32 Claims**



1. In a process for forming a porous cellulosic paper from a cellulose pulp, wherein the improvement consists essentially of thermally treating a cellulosic pulp by contacting the cellulosic pulp with a medium consisting essentially of a non-oxidizing gaseous medium at a temperature of at least about 400° F. for a period of time greater than three seconds and sufficient to render the cellulosic pulp essentially non-bonding, and forming a cellulosic paper with said thermally treated non-bonding pulp, said paper possessing (i) a void fraction of at least 0.85, (ii) a porosity of at least 30 cubic feet per minute per square foot and (iii) a tensile strength of at least 6 lbs./in.

4,557,801

WET-STRENGTHENED CELLULOSIC WEBS

Robert P. Avis, West Chester, Pa., assignor to Scott Paper Company, Philadelphia, Pa.

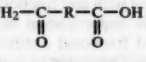
Filed Aug. 20, 1984, Ser. No. 642,213

Int. Cl.⁴ D21H *5/12*

U.S. Cl. 162—157.6 **6 Claims**

1. A cellulosic fibrous paper web containing at least 0.25% based on the weight of the fiber in the web a quaternary ammonium ether of polygalactomannan gum:

wherein the cellulose fibers in said web are chemically modified by a cross-linking reaction with a wet strength resin comprising a water soluble copolymer of a half-acid, half-amide corresponding to the following general formula:



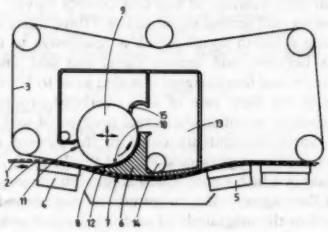
wherein R is a hydrocarbon chain which has radically polymerized with at least one other ethylenically unsaturated monomer, said copolymer being present in an amount of at least 0.1% based on the weight of the fiber in the web.

4,557,802

APPARATUS FOR AFFECTING A WEB DRAINED ON A WIRE

Veikko K. T. Waris, Kyminlinna, Finland, assignor to A. Ahlstrom Osakeyhtio, Noormarkku, Finland

Filed Aug. 15, 1983, Ser. No. 523,658
Claims priority, application Finland, Aug. 23, 1982, 822917
Int. Cl.⁴ D21F *1/66*
U.S. Cl. 162—264 **7 Claims**



1. An apparatus for affecting the draining of a web comprising a lower wire (2) running as an endless loop and supporting the web; at least two members (4,5) disposed at a distance from each other supporting said lower wire; an upper wire (3) running as an endless loop, said upper wire being pressed on the web supported on the lower wire in the area between said at least two members; a dewatering shoe (6) disposed within said upper wire loop, said shoe having a convex curved lower surface and a concave curved upper surface joined at one end to form a wedge-shaped tip, the lower surface being in contact with the upper wire, whereby the web, the upper wire and the lower wire curve downwardly, a first roll disposed out of contact with the upper wire and above said upper curved concave surface of the dewatering shoe, said wedge-shaped tip being positioned under the first half of the roll, said wedge-shaped tip acting as a water doctor in contact with the upper wire, means for controlling the speed of said first roll independently of the speed of the upper wire, said roll together with the upper surface of the dewatering shoe forming a narrow flow channel (12) of essentially constant height for leading upwards the water which has been pressed out.

4,557,803

CRACKING PROCESS CATALYST SELECTION BASED ON CATION ELECTRONEGATIVITY

Mark A. Plummer, Littleton, Colo., assignor to Marathon Oil Company, Findlay, Ohio

Filed Jul. 2, 1984, Ser. No. 627,153
Int. Cl.⁴ C10G *11/08, 47/08*
U.S. Cl. 208—108 **13 Claims**

1. A process of converting a hydrocarbon feedstock in the presence of a tetrachloroaluminate catalyst containing a non-aluminium metal cation to lower molecular weight products comprising:

selecting said tetrachloroaluminate catalyst based on the electronegativity of the non-aluminum metal cation of said catalyst, to substantially retain specific feedstock components on the selected catalyst and substantially release the products from the selected catalyst and wherein the selected catalyst contains substantially no excess $AlCl_3$; and

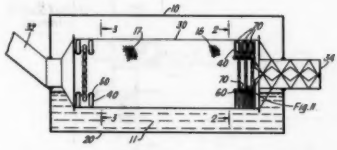
contacting the hydrocarbon feedstock with the selected catalyst in a molten state at a temperature from about 350° C. to about 550° C. and a pressure from about atmospheric to about 14,200 kPa to obtain the lower molecular weight products.

4,557,804

COKE COOLER

Gary J. Baumgartner, Houston; Carl E. Walter, Kingwood, and Arthur J. Post, Jr., Cypress, all of Tex., assignors to Triten Corporation, Houston, Tex.

Filed May 18, 1984, Ser. No. 611,777
Int. Cl.⁴ C10B *39/04, 39/10*
U.S. Cl. 202—227 **9 Claims**



1. A bulk coke cooler comprising

a vessel containing coolant,

a drum rotatable about a horizontal axis in the vessel while partially submerged in the coolant, the drum having an inlet at one end for receiving the hot bulk coke and an outlet at the other end through which the coke is discharged, the side wall of the drum having substantially the same thickness throughout,

a plurality of hollow cooling pockets formed in the wall of the drum so that as the drum rotates through the coolant, coolant enters and leaves the pockets, and

at least contoured wear sleeve connected to at least one of the plurality of hollow cooling pockets on the pocket surface turned toward the axis of the drum, the contour of the interior surface of the wear sleeve corresponding to the contour of the surface of the pocket for a match fit so that substantially all of the interior surface of the sleeve contacts the surface of the pocket, the at least one wear sleeve made of hardfaced plate.

4,557,805

ASSEMBLY FOR CONTROLLING THE POSITIONING OF COKE OVEN OPERATING MACHINES

Manfred Gfrerer, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jan. 25, 1985, Ser. No. 695,070
Claims priority, application Fed. Rep. of Germany, Jan. 26, 1984, 3402690
Int. Cl.⁴ C10B *45/00*
U.S. Cl. 202—270 **12 Claims**

1. In combination with a coke oven in a coking plant, said coke oven being provided with at least one operating machine shiftably mounted on a track alongside said coke oven, an assembly for controlling the positioning of said operating machine along said track, comprising:

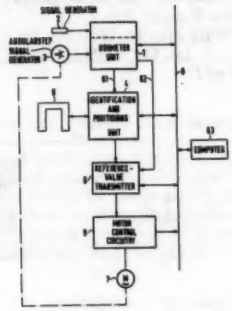
at least one signal plate;

detector means, including a plurality of signal transmitters in the form of infrared light sources and a like plurality of associated signal receivers in the form of infrared light sensors, for cooperating with said signal plate to generate positioning signals indicating the arrival of the shiftable operating machine at an operating station along said track and identification signals indicating the location of said

operating station with respect to the coke oven, said detector means further including a U-shaped carrier having a pair of opposed legs accommodating said transmitters and receivers, one of said carrier and said signal plate being mounted to said operating machine and the other of said carrier and said signal plate being stationary with respect to said coke oven so that said legs of said carrier are disposed on opposite sides of said signal plate upon the arrival of said operating machine at said operating station;

drive means operatively coupled to said operating machine for shifting same along said track; and

control means including an electronic evaluation circuit operatively connected to said detector means and to said



drive means for controlling the motion and positioning of said operating machine along said track in response to said positioning signals and said identification signals so that, during a shifting of said operating machine, the velocity of said operating machine is reduced upon the transmission of a first positioning signal from said detector means to said control means, so that said operating machine is stopped upon the transmission of a second positioning signal and of an identification signal coding a preselected location alongside said coke oven, and so that the speed of said operating machine is increased upon the transmission of the second positioning signal and an identification signal coding an unselected location alongside said coke oven.

4,557,806

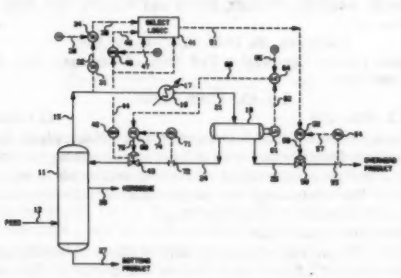
FRACTIONAL DISTILLATION PROCESS CONTROL

Nancy K. Stengle, and James W. Hobbs, both of Sweeny, Tex., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 17, 1985, Ser. No. 692,086

Int. Cl.[4] B01D *3/42*

U.S. Cl. 203—1 **10 Claims**



6. A method for controlling a fractional distillation column utilized to separate components contained in a feedstream in such a manner that the flow rate of a sidedraw product stream withdrawn from said fractional distillation column is maximized without losing control of the liquid level in an overhead accumulator associated with said fractional distillation column, wherein an overhead vapor stream is withdrawn from an upper portion of said fractional distillation column, at least partially condensed, and provided to said overhead accumulator, wherein a first portion of the condensate in said overhead accumulator is provided as an upper external reflux to an upper portion of said fractional distillation column and wherein a second portion of the condensate in said overhead accumulator is withdrawn as an overhead product stream, said method comprising the steps of:

establishing a first signal representative of the flow rate of said overhead product stream required to maintain a desired temperature for said overhead vapor stream, wherein the desired temperature of said overhead vapor stream is such as will substantially maximize the flow of said sidedraw product stream;

establishing a second signal representative of the actual position of a first control valve operably located so as to control the flow of said upper external reflux stream;

establishing a third signal representative of the desired maximum open position of said first control valve;

comparing said second signal and said third signal and establishing a fourth signal which is responsive to the difference between said second signal and said third signal, wherein said fourth signal is scaled so as to be representative of the flow rate of said overhead product stream required to maintain the actual position of said first control valve substantially equal to the desired maximum open position represented by said third signal;

establishing a fifth signal which is equal to the magnitude of said first signal if the magnitude of said second signal is less than the magnitude of said third signal and which is equal to the magnitude of said fourth signal if the magnitude of said second signal is greater than or equal to the magnitude of said third signal;

manipulating the flow of said overhead product stream in response to said fifth signal;

establishing a sixth signal representative of the flow rate of said upper external reflux required to maintain a desired liquid level in said accumulator; and

manipulating said first control valve in response to said sixth signal so as to maintain the actual flow rate of said upper external reflux substantially equal to the flow rate represented by said sixth signal.

4,557,807

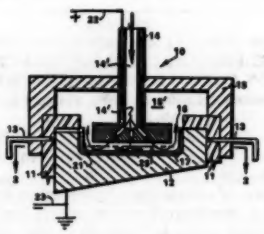
STATIC FREE MOLDED PLASTIC PARTS

Joseph R. Preston, Radnor, and Louis J. Hillenbrand, Columbus, both of Ohio, assignors to Battelle Development Corporation, Columbus, Ohio

Filed Jan. 11, 1985, Ser. No. 691,106

Int. Cl.[4] C25D *1/00, 1/20*

U.S. Cl. 204—4 **10 Claims**



1. An in-the-mold method for forming molded plastic parts having a conductive coating comprising:

providing a mold cavity defined by a mold member having a catalytic surface
connecting the mold member as an electrode to a current source
electrodepositing a conductive polymer onto the catalytic surface of the mold member to form a conductive film
introducing into the mold cavity a viscoelastic molding material
compressing the molding material within the molding cavity so as to achieve greater adherence of the conductive film to the molding material than the adherence of the conductive film to the catalytic surface of the mold member
solidifying and/or curing the viscoelastic molding material to form a molded part
releasing the molded part with adhering conductive film from the mold cavity.

4,557,808

METHOD OF APPLYING A CORROSION-PROOF AND WEAR-RESISTANT COATING TO A WORKPIECE

Theo Strunck, Werne, and Erich Fricke, Kamen-Methler, both of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Lunen, Fed. Rep. of Germany

Filed May 25, 1983, Ser. No. 498,165

Claims priority, application Fed. Rep. of Germany, Jun. 2, 1982, 3220723

Int. Cl.⁴ C25D *5/40*

U.S. Cl. 204—29 **17 Claims**

1. A method of applying a corrosion-proof and wear-resistant coating to a workpiece, the method comprising the steps of applying a layer of nickel having a thickness of no more than 60 microns to the workpiece by a currentless nickel-plating process, activating the nickel layer by an electrolytic treatment conducted cathodically in a sulphuric acid bath which has 5 to 20% by volume of sulphuric acid at a temperature of between 25° C. and 60° C. and a current density of between 10 and 60 A/sq.dm., briefly interrupting the application of current during said electrolytic treatment in order to still the sulphuric acid bath so that hydrogen can escape, thereby reducing the possibility of hydrogen diffusing into the nickel layer, and employing a chromium plating process to coat the activated nickel layer with a microcracked chromium coating having a thickness of between 20 and 80 microns.

4,557,809

ELECTROCHEMICAL SYNTHESIS OF ZEROVALENT TRANSITION METAL ORGANOPHOSPHORUS COMPLEXES

Clarence E. Albertson, Villa Park, Ill., assignor to Borg-Warner Chemicals, Inc., Parkersburg, W. Va.

Filed Apr. 12, 1985, Ser. No. 722,471

Int. Cl.⁴ C25C *1/00*

U.S. Cl. 204—59 QM **12 Claims**

1. An electrochemical process for the production of a zerovalent metal/organo-phosphorus ligand complex by passing a current through an electrolyte bath which includes a transition metal salt and a trivalent organo-phosphorus compound, the improvement comprising said current being a pulsed direct current.

4,557,810

BONDED ASBESTOS DIAPHRAGMS

Richard N. Beaver, Angleton, Tex.; Kenneth R. Evans, Russellville, Ark., and Donald D. Waters, Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 270,769, Jun. 5, 1981, Pat. No. 4,530,749. This application Dec. 7, 1984, Ser. No. 679,519

Int. Cl.⁴ C25B *1/16, 11/03, 13/06*

U.S. Cl. 204—98 **13 Claims**

13. A method for brine electrolysis comprising passing a direct current through an aqueous NaCl electrolyte in an amount sufficient to electrolytically decompose the NaCl, said current being carried by the electrolyte through a Na_2CO_3-containing fluoropolymer-bonded asbestos diaphragm between anode and cathode, wherein the amount of Na_2CO_3 is in the range of about 5% to about 20% by weight of the diaphragm.

4,557,811

REGENERATION OF AN AMMONIACAL ETCHING SOLUTION WITH RECYCLING OF SOLUTION WITH ELECTROLYTICALLY REDUCED METAL CONTENT TO THE REGENERATION INPUT

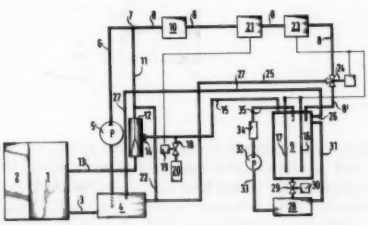
Leander Fürst, Jülich, and Walter Holzer, Meersburg, both of Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich Gesellschaft mit beschrankter Haftung, Postfach and Elo-Chem Atztechnik GmbH, Meersburg, both of, Fed. Rep. of Germany

Filed Nov. 7, 1984, Ser. No. 669,312

Claims priority, application Fed. Rep. of Germany, Nov. 8, 1983, 3340342

Int. Cl.⁴ C25C *1/00, 7/00*

U.S. Cl. 204—105 R **6 Claims**



1. Process for regenerating an ammoniacal etching solution wherein etching solution to be regenerated, withdrawn from an etching chamber, is circulated in a loop in the course of which a gas containing oxygen is mixed into said solution for reoxidation thereof, after which the solution is returned to said etching chamber, comprising, in accordance with the invention, the further steps of:

branching off, at a location in said loop upstream of the admixture of oxygen to said solution, only a fractional portion of said solution from said loop and passing it through an electrolysis cell, where it is at least intermittently subjected to electrolysis for separating out etched-off metal, and

returning etching solution of at least intermittently reduced metal content, taken out of the electrolysis cell, to said circulation loop at a location upstream of the place of branching off of said solution portion, whereby the metal content of said branched off solution portion is quickly reducible whenever said metal content becomes excessive.

4,557,812

PURIFYING MIXED-CATION ELECTROLYTE

Francis Goodridge, Ponteland; Raymond E. Plimley, Jesmond, and Allen R. Wright, Gateshead, all of England, assignors to National Research Development Corporation, London, England

Filed Jul. 30, 1984, Ser. No. 635,579

Claims priority, application United Kingdom, Aug. 10, 1983, 8321556; Sep. 20, 1983, 8325169

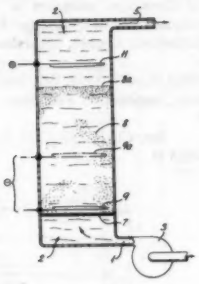
Int. Cl.⁴ C25F *5/00*

U.S. Cl. 204—130 **16 Claims**

16. A method of purifying an electrolyte containing cations of a less noble metal from contamination by cations of a more noble metal, said method comprising:

upwardly fluidizing a bed of at least superficially electronically conductive particles with the electrolyte to provide a fluidized bed, the particles being more noble than said

less noble metal, a cathode current feeder being provided in contact with said bed, said cathode current feeder being at least one-half of the way up said fluidized bed, an anode being provided in contact with said bed but being of a material having a contact resistance in air between itself and a copper test surface of at least ten times the contact resistance under the same conditions of measurement between the copper test surface and another surface of copper, said anode being spaced from said cathode current feeder in the direction of fluidization of said bed;



applying a voltage between said cathode current feeder and said anode, to cause said cations to be electroplated on said particles of said bed, said less noble metal upon being electroplated re-dissolving with concomitant cementation of the more noble metal on the particles;

removing the electrolyte which has passed through the bed and in which the concentration of the nobler-metal cations, has been reduced.

4,557,813

MAGNETIC RECORDING MEDIA

Guenter Heil, Ludwigshafen; Werner Lenz, Bad Duerkheim, and Jenoe Kovacs, Hessheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 10, 1984, Ser. No. 648,946

Claims priority, application Fed. Rep. of Germany, Sep. 9, 1983, 3332564

Int. Cl.⁴ C08F *2/46*

U.S. Cl. 204—159.14 **1 Claim**

1. A magnetic recording medium which comprises a non-magnetic base and one or more magnetic layers consisting of an organic binder matrix containing finely divided magnetic material, the said matrix being obtained by electron beam curing of a mixture of from 60 to 100% by weight of a polyurethane acrylate polymer possessing polymerizable double bonds and from 0 to 40% by weight of an acrylate and/or an acrylate prepolymer and/or an N-vinyl monomer and/or an N-vinyl prepolymer, wherein the polyurethane acrylate polymer is composed of

(1) one or more diisocyanates,

(2) one or more oligomeric or polymeric diols,

(3) one or more low molecular weight cyclic diols, and

(4) one or more monohydroxyalkyl acrylates, and the amount of NCO groups of the diisocyanate is from 95 to 105% of the number of equivalents of OH groups of components 2, 3 and 4 and the molar amounts of the OH-containing components are chosen so that the concentration of urethane groups is from 2.4 to 3.9 moles per kg of polyurethane acrylate polymer, with the proviso that the number average molecular weight of the polymer is from 1,800 to 10,000 and the ratio of the weight average to the number average molecular weight is from 2.2 to 3.5.

4,557,814

SYNTHETIC RESIN CARRYING BASIC NITROGEN GROUPS, AND ITS PREPARATION

Eberhard Schupp, Schwetzingen; Werner Loch, Erpolzheim; Rolf Osterloh, Gruenstadt, and Klaas Ahlers, Muenster, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 11, 1984, Ser. No. 629,762

Claims priority, application Fed. Rep. of Germany, Jul. 12, 1983, 3325061

Int. Cl.⁴ C08G *59/50, 59/14*

U.S. Cl. 204—181.7 **17 Claims**

1. A synthetic resin which carries basic nitrogen groups and can be diluted with water as a result of protonation with an acid, and which is obtainable by reacting

(A) one or more epoxy resins having a mean molecular weight $\bar{M}_n$ of from 300 to 6,000 and containing on average from 1.5 to 3.0 epoxide groups per molecule with

(B) a diketimine of a primary diamine and, optionally,

(C) a secondary amine, which may additionally contain a tertiary amino group, a ketimine of a primary monoamine or a ketimine of a primary/tertiary diamine.

9. A coating agent which contains, as a binder, a synthetic resin as defined in claim 1 which carries basic nitrogen groups and can be diluted with water as a result of protonation with an acid and additionally contains a crosslinking agent.

4,557,815

METHOD OF CONCENTRATING SILKA IN AN AQUEOUS ALKALI METAL SILICATE SOLUTION

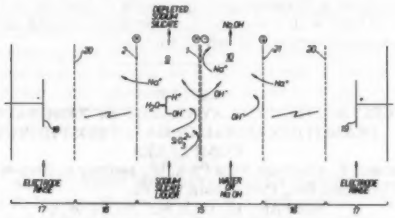
Graham W. Scott, Northwich, and James H. Steven, Runcorn, both of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Sep. 21, 1984, Ser. No. 653,047

Claims priority, application United Kingdom, Sep. 23, 1983, 8325479

Int. Cl.⁴ C25B *7/00, 1/16*

U.S. Cl. 204—182.2 **8 Claims**



1. A method for increasing the ratio of silica to alkali in an aqueous solution of alkali metal silicate which method comprises:

(1) passing the aqueous silicate solution through an electrodialysis stack, said stack comprising alternating cation-exchange membranes and bipolar membranes having a cation-exchange side and an anode-exchange side, the membranes being mounted between electrodes and spaced apart to form a plurality of cell pairs comprising a concentating cell between the cation-exchange membrane and the anion-exchange side of the bipolar membrane and a diluting cell between the cation-exchange side of the bipolar membrane and the adjacent cation-exchange membrane,

(2) applying a DC potential to the electrodes to form an anode and a cathode,

(3) feeding the aqueous silicate solution to the diluting cells in the stack,

(4) feeding water or an aqueous solution to the concentrating cells in the stack, and

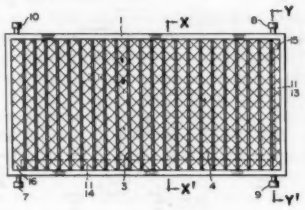
(5) withdrawing from the diluting cells the aqueous silicate solution depleted of alkali metal ions.

4,557,816

ELECTROLYTIC CELL WITH ION EXCHANGE MEMBRANE

Muneo Yoshida, and Yoshitomo Tamura, both of Nobeoka, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jun. 24, 1983, Ser. No. 507,558
Claims priority, application Japan, Jul. 6, 1982, 57-116236
Int. Cl.[4] C25B *9/00, 11/03, 13/08*
U.S. Cl. 204—255 **29 Claims**



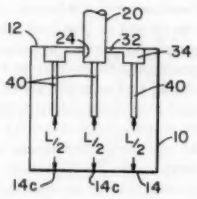
1. A chlor-alkali electrolytic cell which is divided by a cation exchange membrane to define an anode compartment and a cathode compartment, each compartment having at the lower part thereof an inlet for fresh electrolyte and in the upper part thereof an outlet for spent electrolyte and electrolytic products, each compartment further including an electrode with a front side thereof being disposed close to said cation exchange membrane and having a rear space behind said electrode, and at least one of said compartments including a duct positioned within said rear space, said inlet and said outlet being positioned diagonally opposite to each other in the compartment, said duct comprising a horizontal portion having a lower opening near the inlet for fresh electrolyte and at least one vertical portion communicating with and substantially perpendicular to said horizontal portion, and having an upper opening near the outlet for spent electrolyte and electrolytic product, the ratio of the area of the duct projected against the electrode to the area of the electrolytic field being less than $\frac{1}{3}$:1, whereby an electrolyte flow is established through said duct from the upper part to the lower part of the compartment.

4,557,817

REDUCED VOLTAGE ELECTRODE DESIGN

Robert L. Voegel, and Kenton B. Wright, both of Newburgh, Ind., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Nov. 13, 1984, Ser. No. 670,078
Int. Cl.[4] C25D *17/12*
U.S. Cl. 204—286 **22 Claims**



1. An improved electrode assembly for use in a cell for the production of metal by electrolytic reduction in a molten salt bath comprising:

(a) a nonmetallic conductive electrode having a top surface;

(b) a central current carrying support shaft received in a central bore in said electrode extending axially downward from said top surface;

(c) fin assemblies extending radially from said central support shaft in said nonmetallic conductive electrode, said fin assemblies comprising a plurality of gate members extending radially from said central shaft adjacent said top surface of said nonmetallic conductive electrode and wing members extending from said gate members downwardly into said nonmetallic conductive electrode from said top surface; and

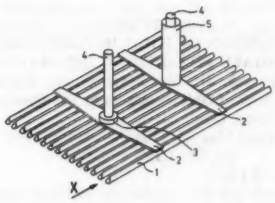
(d) metal conductive means, comprising a metal which will not contaminate the salt bath, extending downwardly in said electrode beyond the depth of said central shaft and fin assemblies; whereby current passing to said nonmetallic conductive electrode from said central shaft may be distributed evenly in said electrode to minimize the voltage drop in said electrode and permit the cell to run cooler.

4,557,818

GAS-EVOLVING METAL ELECTRODE

Hans Roos, Bad Durkheim; Dieter Schlaefer; Hugo Boehn, both of Ludwigshafen; Knut Bittler, Speyer, and Heinz Kilthau, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 12, 1984, Ser. No. 630,184
Claims priority, application Fed. Rep. of Germany, Jul. 13, 1983, 3325187; Dec. 16, 1983, 3345530
Int. Cl.[4] C25B *11/02*
U.S. Cl. 204—288 **4 Claims**

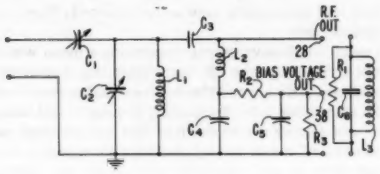


1. A gas-evolving metal anode for mercury cells for chlor-alkali electrolysis, which consists of profiles arranged parallel to one another in a horizontal plane, where the effective electrode surface facing the counter-electrode of the cells is curved and the profiles are connected to one another by means of current distributors which are at right angles to the profiles and provided with a current supply, wherein the curvature of the effective electrode surface changes, in the region of the gaps between two profiles, to a curvature with a smaller radium (r), the radius (R) which determines the curvature of the effective electrode surface being from 7 to 180 mm and the smaller radium (r) being from 0.5 to 4 mm, and the profiles are terminated above by means of two lateral surfaces which are tangential to the curvature and enclose an angle (alpha) of from 20° to 120° at their point of intersection so that the cross-section of the gap between two profiles through which the gas formed at the effective electrode surface is removed has the profile of a jet-like rounded inlet zone and a calming-zone widening upward like a diffusor.

4,557,819
SYSTEM FOR IGNITING AND CONTROLLING A WAFER PROCESSING PLASMA

David D. Meacham, Redwood City, and John J. Haruff, San Carlos, both of Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.

Filed Jul. 20, 1984, Ser. No. 632,783
Int. Cl.[4] C23C 15/00
U.S. Cl. 204—298 3 Claims



1. A system for delivering RF power to a plasma for etching or coating a substrate comprising:
an RF power generator;
an impedance magnitude control including a first variable capacitor coupled in series with said power generator;
an impedance phase control including an inductor connected in shunt across the output of said first variable capacitor and a second variable capacitor connected in shunt across said inductor;
a plasma load connected in shunt across said second variable capacitor;
a vacuum chamber for confining the plasma;
an electrode for supporting a substrate for etching thereof by gas ions formed in the plasma, and said electrode and said chamber forming electrodes for said plasma;
a shield wall in said chamber and around said substrate, said shield wall being electrically connected to said chamber; and
a rotating magnet above the substrate surface to be etched.

4,557,820
CONVERSION OF HIGH BOILING ORGANIC MATERIALS TO LOW BOILING MATERIALS

Stephen C. Paspek, Jr., No. Royalton, and Curtis D. Coker, Cleveland, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed May 24, 1984, Ser. No. 613,885
Int. Cl.[4] C10G 1/06, 47/08
U.S. Cl. 208—8 LE 29 Claims

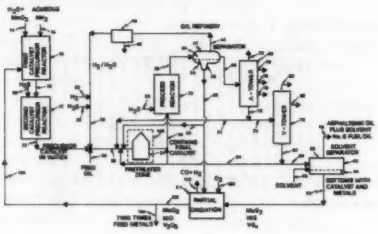
1. A process for the conversion of high boiling organic materials to lower boiling materials comprising contacting said high boiling organic materials at a temperature of from about 300° to 1000° C. and at a reaction pressure of from about 2000 to 9,000 psi in a reducing atmosphere with an aqueous acidic medium containing, as a promoter, a halogen, a hydrogen halide, a halogen-containing organic compound which can form a halide or a hydrogen halide in the aqueous acidic medium under the process conditions, or mixtures thereof whereby the high boiling organic material and aqueous acidic medium form a substantially single phase system.

4,557,821
HEAVY OIL HYDROPROCESSING

Jaime Lopez; Joel D. McKinney, and Eugene A. Pasek, all of Pittsburgh, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Aug. 29, 1983, Ser. No. 527,414
Int. Cl.[4] C10G 45/04, 45/46, 45/60, 47/06
U.S. Cl. 208—108 37 Claims

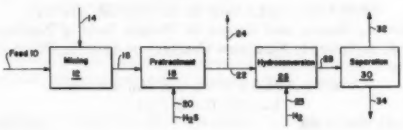
1. A hydroprocess comprising introducing feed oil, hydrogen, water, hydrogen sulfide and hydrogenation catalyst to a hydroprocessing zone, the weight ratio of water to oil being between 0.005 and 0.25, the partial pressure of hydrogen sulfide being between 20 and 400 psi, the hydrogen partial pressure being between 350 and 4500 psi, the temperature being between 650° and 1000° F., said water being at least partially in the vapor phase, said hydrogenation catalyst comprising sulfided molybdenum which is present in said hydroprocess in the molybdenum as metal to oil weight ratio of 0.0005 to 0.25 with said catalyst having been prepared by reacting aqueous ammonia and molybdenum oxide with a weight ratio of ammonia to molybdenum as metal of 0.1 to 0.6 to form aqueous ammonium molybdate, reacting said aqueous ammonium molybdate with hydrogen sulfide to form a precursor slurry, mixing said precursor slurry with feed oil, hydrogen and hydrogen sulfide and heating said mixture at a pressure between 500 and 5000 psi so that it is within the temperature range of 150° to 350° F. for a duration of 0.05 to 0.5 hours, further heating said mixture so that it is within the temperature range of 351° to 750° F. for a time duration of 0.05 to 2 hours, and said hydroprocess to include recycling to said hydroprocessing zone a hydrogen-hydrogen sulfide stream separated from the hydroprocessing zone effluent wherein the partial pressure of hydrogen sulfide is at least 20 psi so that the circulation of hydrogen sulfide is greater than 5 SCF per pound of molybdenum as metal and the hydrogen circulation rate is between 500 to 10,000 SCFB.



4,557,822
HYDROCONVERSION PROCESS

Roby Bearden, Jr., and Clyde L. Aldridge, both of Baton Rouge, La., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Dec. 27, 1982, Ser. No. 453,529
Int. Cl.[4] C10G 1/06, 47/10
U.S. Cl. 208—112 10 Claims



1. In a hydroconversion process wherein a slurry comprising a hydrocarbonaceous oil and an iron-coal catalyst is contacted with a hydrogen-containing gas in a hydroconversion zone at hydroconversion conditions to convert at least a portion of said oil to lower boiling products and thereby produce a hydroconverted oil, said iron-coal catalyst being present in said slurry in an amount ranging from about 0.1 to 5 weight percent, based on said oil, the improvement which comprises pretreating said slurry with a substantially pure hydrogen sulfide or with a gaseous mixture comprising from about 1 to about 99 mole percent hydrogen sulfide, at a temperature below about 750° F., for a period of time ranging from about 30 seconds to 2 hours prior to subjecting said slurry to said hydroconversion conditions, including a temperature greater than said pretreatment temperature.

4,557,823
HYDROFINING PROCESS FOR HYDROCARBON CONTAINING FEED STREAMS

Simon G. Kukes; Robert J. Hogan, and Daniel M. Coombs, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 22, 1984, Ser. No. 623,665
Int. Cl.⁴ C10G *45/00*
U.S. Cl. 208—216 R **21 Claims**

1. A process for hydrofining a hydrocarbon-containing feed stream comprising the steps of:

introducing a suitable decomposable compound selected from the group consisting of compounds of the metals of Group IVB of the Periodic Table into said hydrocarbon-containing feed stream; and

contacting said hydrocarbon-containing feed stream containing said decomposable compound under suitable hydrofining conditions with hydrogen and a catalyst composition comprising a support selected from the group consisting of alumina, silica and silica-alumina and a promoter comprising at least one metal selected from Group VIB, Group VIIB and Group VIII of the Period Table, wherein a sufficient quantity of said decomposable compound is added to said hydrocarbon-containing feed stream to result in a concentration of Group IVB metal in said hydrocarbon-containing feed stream in the range of about 5 to about 50 ppm.

4,557,824
DEMETALLIZATION OF HYDROCARBON CONTAINING FEED STREAMS

Simon G. Kukes, Bartlesville, and Gil R. Hawley, Dewey, both of Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

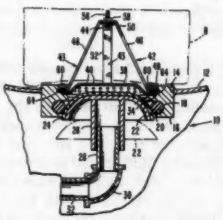
Filed Jan. 31, 1984, Ser. No. 575,592
Int. Cl.⁴ C10G *45/00*
U.S. Cl. 208—251 H **15 Claims**

1. A process for the demetallization of a hydrocarbon containing feed stream, which contains metals, comprising the step of contacting said hydrocarbon containing feed stream under suitable demetallization conditions with hydrogen and a catalyst composition comprising zirconium phosphate, cobalt phosphate and iron phosphate.

4,557,825
BAG BREAKING AND SCREENING DEVICE, ESPECIALLY FOR BLAST CLEANING SYSTEMS

James M. Wittes, Linden, N.J., and Cecilia Sweeney, Yardley, Pa., assignors to Empire Abrasive Equipment Corporation, Langhorne, Pa.

Filed Jul. 25, 1984, Ser. No. 634,259
Int. Cl.⁴ B07B *1/00*; B65B *3/16, 1/04*; B67B *7/24*
U.S. Cl. 209—3 **9 Claims**



1. A device for breaking open a bag of particulate materials above the fill opening of an enclosure adapted for containing a quantity of said materials, for example the pressure tank of a blast cleaning system, comprising:

(a) a support structure mounted on said enclosure and extending about said opening;

(b) a plurality of legs extending from the support structure at locations angularly spaced thereabout and converging above said opening to form an upwardly tapered, open frame terminating in a point and adapted to break open a bag dropped thereon, for gravitation of the contents thereof through the fill opening;

(c) means for securing said legs to the support structure;

(d) a screen extending across the fill opening below the legs; and

(e) means simultaneously, removably clamping both the screen and the several legs to the support structure.

4. A device for breaking open a bag of particulate materials above the fill opening of an enclosure, such as the pressure tank of a blast cleaning system, adapted for holding a quantity of said materials, comprising:

(a) an annular holder fixedly secured to said enclosure within said opening and having opposed, spaced shoulders facing inwardly of said opening;

(b) a screen extending across the opening and having a peripheral portion seating on one of said shoulders;

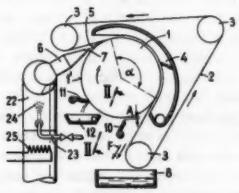
(c) a bag opening frame comprising a plurality of legs extending upwardly from the holder in converging relation and joined together at their point of convergence, said legs including outwardly directed feet extending into the space between said shoulders above the peripheral portion of the screen; and

(d) means for spreading the feet and said peripheral portion apart to clampably engage the same against the respective shoulders.

4,557,826
METHOD OF AND APPARATUS FOR SEPARATING TACKY CONTAMINANTS FROM A STOCK SUSPENSION

Wolfgang Flucher, Balsthal, Switzerland, and Wolfgang Siewert, Ravensburg-Weingartshof, Fed. Rep. of Germany, assignors to Escher Wyss GmbH, Ravensburg/Württ., Fed. Rep. of Germany

Filed Apr. 11, 1983, Ser. No. 483,529
Claims priority, application Switzerland, Apr. 23 1982, 2526/82
Int. Cl.⁴ B03B *1/02*
U.S. Cl. 209—11 **10 Claims**



1. A method of separating tacky contaminants from an aqueous stock suspension, comprising the steps of:

establishing a mass force field to which the stock suspension is exposed;

feeding said stock suspension in the form of a stock stream towards the mass force field;

moving said stock suspension in the form of the stock stream across said mass force field exerting said mass forces upon the stock stream:

contacting a pick-up surface with said stock stream on a side thereof located opposite to the direction of the mass forces;

exerting the mass forces of the mass force field upon the stock suspension in a direction extending essentially radially outward of the pick-up surface;

adhering said tacky contaminants to be separated at said pick-up surface which possesses adhesion properties with respect to the tacky contaminants;

separating said pick-up surface containing thereat the adhering tacky contaminants from said stock stream; and

removing the adhering tacky contaminants from the pick-up surface.

4,557,827

ELECTROSTATIC FREE-FALL SEPARATOR WITH FEEDING ARRANGEMENT

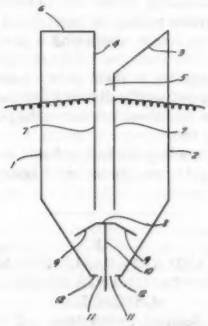
Günter Fricke; Iring Geisler, both of Bad Hersfeld, and Helmut Zentgraf, Burghaun, all of Fed. Rep. of Germany, assignors to Kali und Salz AG, Kassel, Fed. Rep. of Germany

Filed Oct. 31, 1983, Ser. No. 548,072

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1982, 3247064

Int. Cl.⁴ B03C *7/12*

U.S. Cl. 209—127.4 **6 Claims**



1. An electrostatic free-fall separator, comprising a feeding arrangement located upstream of said separator for feeding fine-particle materials to said electrostatic free-fall separator, said feeding arrangement comprising a housing having two substantially vertical walls with lower edges defining an outlet slot; means forming an inlet of said housing and including a first substantially vertical wall portion and a guiding surface located opposite to said first wall portion and inclined thereto so as to form a funnel, said inclined guiding surface having a lower edge which extends substantially vertically and is formed as a substantially vertical second wall portion which is parallel to said first wall portion and limits together with the latter a longitudinal passage of a predetermined width so that a fine-particle material to be separated arrives over said guiding surface into said funnel, strikes against said first wall portion and flows through said longitudinal passage downwardly; two electrodes located under said passage and relative to one another at a distance which is somewhat greater than the width of said longitudinal passage so that the particles of the material exiting said longitudinal passage are deflected in correspondence with their charge to a respective one of said electrodes and are thereby presorted; guiding means located under said electrodes and arranged to guide the material after leaving said electrodes in two separate partial streams in correspondence with the presorting between said electrodes; and braking means including two braking members located before said outlet slot so that before leaving the arrangement the separate partial streams form over said braking members two movable layers from which the particles are discharged, presorted in accordance with their charge and in the form of two homogeneous fogs, to be supplied with an electrostatic field of said electrostatic free-fall separator for subsequent separation in the latter.

4,557,828

METHOD IN THE OPERATION OF MAGNETIC SEPARATORS

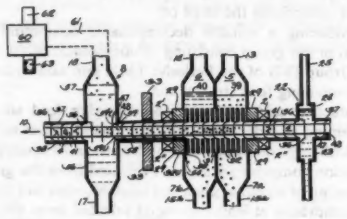
Vital Dittrich, Sala, Sweden, assignor to Sala International AB, Sala, Sweden

Filed Nov. 22, 1982, Ser. No. 444,052

Claims priority, application Sweden, Nov. 30, 1981, 817151

Int. Cl.⁴ B03C *1/02*

U.S. Cl. 209—214 **3 Claims**



1. A method of operating magnetic separators of the kind having a plurality of sequentially arranged adjacent canisters (4) containing a magnetizable matrix of induction poles (41) and having upper and lower openings for flow therethrough of a fluid to be cleaned of material contained therein; upper and lower canister enclosing and path defining structures (37, 38) arranged, respectively, above and beneath the canisters (4) and defining a path through which said canisters (4) pass through a magnetic field within a coil (2) and a yoke (3) which surround portions of said structures (37, 38) with portions (31) of the yoke (3) and portions of said structures (37, 38) defining passages (32) therethrough; longitudinal and transverse flexible sealing lips 36 secured along upper and lower edges of said canisters (4) and making sliding sealing contact with the enclosing structures (37, 38) to bend each transverse seal lip (36) into a convex-concave configuration where adjacent canasters are separated by a common transverse seal lip; a feed station (5) and a rinse station (6) sequentially arranged within the magnetic field with fluid inlets (13, 14) above canisters (4) for passing the fluid to be cleaned and then a rinse fluid both downwardly through the passages (32) and canisters (4); and a flush station (8) spaced away from the magnetic field, with the flushing station (8) having a first flushing conduit (56) beneath the lower enclosing structure (38) and a second flushing conduit (57) above the upper enclosing structure (37), and with said conduits (56, 57) and structures (37, 38) defining a flushing fluid passage to and from a canister (4) in the flushing station (8); the method comprising the steps of:

(a) transporting said canisters (4) sequentially through said feed station (5) and passing fluid to be cleaned downwardly into said canisters (4), and through said rinse station (6) and passing a rinse fluid downwardly into said canisters and through flush station (8) and thereby bend each said transverse sealing lip (36) approaching the flush station (8) to present a convex side (47) thereof facing the flush station (8) and an oppositely facing concave side (48);

(b) regulating a rinse fluid level spaced above the canisters (4) to apply fluid pressure to the concave side (48) of transverse sealing lips (36) between the rinse station (6) and flush station (8) to thereby press each such sealing lip (36) against adjacent enclosing structure (37, 38);

(c) supplying flushing fluid to said first flushing conduit (56) beneath the lower enclosing structure (38); and

(d) drawing a suction on the second flushing conduit (57) above the upper enclosing structure (37) to draw fluid upwardly from said canisters (4) and to provide a lower pressure on the convex side of said transverse sealing lips (36) between rinse station (6) and flush station (8) than is being applied on the concave side of each of such transverse sealing lips (36) to thereby provide a resultant of

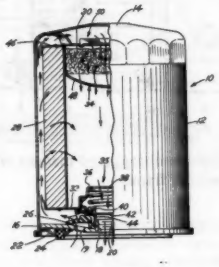
force acting upon the concave sides of such transverse sealing lips (36) which forces such sealing lips (36) into fluid sealing engagement against the adjacent enclosing structure (37, 38).

4,557,829

TWO STAGE FILTER

Gerald S. Fields, Olney, Ill., assignor to Champion Laboratories, Inc., West Salem, Ill.

Filed Jun. 13, 1984, Ser. No. 620,316
Int. Cl.[4] B01D *27/10*
U.S. Cl. 210—132 **6 Claims**



4. In a multi-stage filter unit comprising a hollow housing having one closed end and the other end being closed except for means defining a pair of ports providing respectively a liquid inlet and a liquid outlet, a first annular filter element in said housing having means defining a central opening therethrough and a second filter element in said housing disposed within said opening, the improvement comprising said liquid passing substantially through only the first filter element when the liquid is clean, and then passing through the second filter element as the first filter element clogs, said second filter element being a porous disc retained in said opening by a foraminous element having a cylindrical portion, said porous disc being of substantially uniform depth when clean, said porous disc being deformable in response to increase in differential pressure due to clogging of the porous disc after clogging of the first filter element to reduce the length of the liquid flow path through the porous disc and relieve some of the fluid pressure, without opening an unfiltered path for liquid, the disc center portion being deformed concavely and the circumference of the disc being moved inwardly from the adjacent inner circumferential surface of the cylindrical portion of the foraminous element as the disc center portion is deformed concavely to reduce the length of the flow path through the disc.

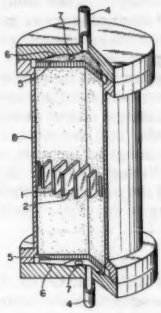
4,557,830

PACKED COLUMN HAVING PRESSURE-ABSORBING MECHANISM

Hatsuki Onitsuka, Nobeoka; Shin Saito, and Hideo Fukuda, both of Hyuga, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Feb. 27, 1984, Ser. No. 594,271
Claims priority, application Japan, Apr. 26, 1983, 58-72268
Int. Cl.[4] B01D *15/08*
U.S. Cl. 210—198.2 **7 Claims**

1. A packed column having a pressure-absorbing mechanism which is used as a reaction column or a column for separating or exchanging solutes, wherein (1) the inside diameter [D(cm)] is 10 cm or more, (2) the pressure-absorbing mechanism comprises solid parts and passage spaces defined thereby, through which spaces packings can pass, (3) the circumference ratio as defined herein of most of the passage spaces is (10/D) or more and their lengths in the flow direction are larger than the −1.5th power of the circumference ratio and are not more than 16% of the column length, (4) the passage spaces exist within 1 cm from any position on the upper and lower sides of most of the aforesaid solid parts, and (5) the shielding degree as



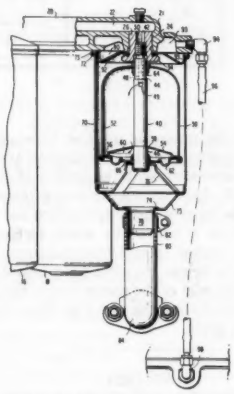
defined herein of the pressure-absorbing mechanism is 0.01 or more and 0.8 or less.

4,557,831

CENTRIFUGAL FILTER ASSEMBLY

Frederick E. Lindsay, Greencastle, Pa., and Willis R. Alexander, Hagerstown, Md., assignors to Mack Trucks, Inc., Hagerstown, Md.

Filed Apr. 12, 1984, Ser. No. 599,484
Int. Cl.[4] B04B *9/06*
U.S. Cl. 210—232 **12 Claims**



1. A centrifugal oil filter assembly for an engine having engine oil to be filtered, an engine block and a crankcase, the filter being of the type having a rotor with a hollow rotatable shell, means for collecting contaminants in oil to be filtered at the inside of the hollow shell casing, exit openings for clean oil to exit from the hollow shell and simultaneously provide a reaction torque thereto, aligned bearing means at the top and bottom of the rotor, and an outer oil filter casing housing the hollow rotatable shell, the outer filter casing having an outlet opening with a fitting for connection to a tubular conduit to return filtered oil to the engine, and means for supplying oil to be filtered from the engine to the inside of the hollow shell casing through the bearing means at the top of the shell casing, with improvements for providing an arrangement in which the rotor is disposable, discardable and replaceable, while the outer filter casing of the filter assembly is permanent and reuseable, the improvements comprising:

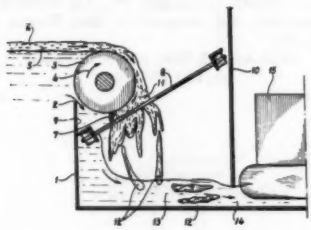
(a) the rotor being constructed of material such that it can be economically disposed of;
(b) the outer filter casing having an open top of a diameter greater than the diameter of the rotor;
(c) a top member for closing the open top of the outer casing;
(d) an adaptor plate means mounting the top member for the outer shell casing;
(e) a rigid rotor support shaft threadedly connected to the adaptor plate means and fixedly connected to the outer casing, the shaft having a central passage partially therein with an exit opening into the rotor, the shaft providing support for the bearings on the rotor; and
(f) means for establishing a path of fluid communication from the inside of the outer casing through the top member to the pressure of the engine crankcase.

4,557,832

APPARATUS FOR REMOVING OIL FROM WATER

Pieter Verboom, Alblasserdam, Netherlands, assignor to IHC Holland N.V., Papendrecht, Netherlands

Filed Jan. 25, 1984, Ser. No. 573,820
Claims priority, application Netherlands, Jan. 25, 1983, 8300266
Int. Cl.⁴ E02B *15/04*
U.S. Cl. 210—242.3 **3 Claims**



1. An apparatus for removing oil from water, comprising a roller which can be driven and has a horizontal axis of rotation, a scraper blade cooperating with the surface of the roller and a receiving tray; the improvement in which the roller has its upper surface at the level of the water surface and is above the receiving tray which is below the water surface, a suction pressure pump connected to said receiving tray, and a grate located immediately below the roller and below the scraper blade and above the inlet of the pump so that the grate subdivides the oil separated from the water by the roller as the oil passes through the grate.

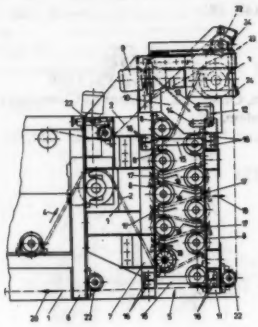
4,557,833

APPARATUS FOR DEWATERING WATER-CONTAINING MATERIALS

Franz Krenmayr, Linz; Franz Lichtenegger, Liezen, and Peter Göschl, Aigen, all of Austria, assignors to Voest-Alpine Aktiengesellschaft, Vienna, Austria

Filed Aug. 5, 1983, Ser. No. 520,643
Claims priority, application Austria, Aug. 13, 1982, 3097/82
Int. Cl.⁴ B01D *33/14*
U.S. Cl. 210—386 **14 Claims**

1. Apparatus for dewatering water-containing materials such as sludges, in which the material, preferably having already been dewatered, is passed between water-permeable bands or sieve belts travelling along a closed path over rolls supported in bearings in at least two separated frames arranged in a substantially parallel relation, means to shift all of the rolls of at least one first frame in a direction parallel to the rolls of a second frame and means to shift all of the rolls of said first frame in a direction transverse to said parallel shifting movement and means to fix the rollers of said first frame so they are positioned opposite the rollers of the second frame in a first fixed position and means to fix the rollers of said first frame so



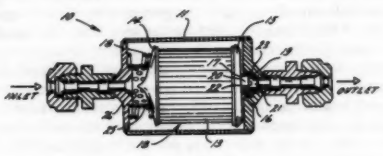
they are positioned in a staggered manner with respect to the rollers of said second frame.

4,557,834

FLUID FILTER WITH AXIAL AND CIRCUMFERENTIAL SEAL

Robert Mason, Placentia, Calif., assignor to Pall Corporation, Glen Cove, N.Y.

Filed May 13, 1983, Ser. No. 494,187
Int. Cl.⁴ B01D *27/10*
U.S. Cl. 210—445 **18 Claims**

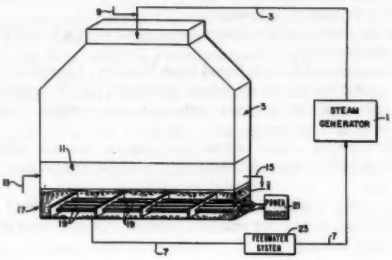


1. In a fluid filter having a housing with means defining an inlet and means defining an outlet, the combination comprising a filter cartridge disposed in the housing and comprising a generally tubular filter confined between end caps at each end thereof, one end cap being closed and the other end cap having a nipple-like extension with an opening therethrough communicating the interior of the tubular filter with the outlet, the extension being telescopically received by a generally mating socket, means for establishing both an axial and circumferential sealing condition between the extension and the mating socket, with at least the circumferential sealing condition being maintained over a limited range of travel of the filter cartridge relative to the housing, said sealing means including a gasket mounted about the extension within the socket and urged into axial and circumferential sealing condition, means for urging the extension into the axial sealing condition with the socket, and means for restraining the axial movement on the filter cartridge to prevent loss of the circumferential sealing condition between the extension and the socket in the event the flow of fluid through the filter is reversed.

4,557,835
PROCESS FOR REMOVAL OF DISSOLVED OXYGEN FROM STEAM GENERATION SYSTEMS

Donald G. Lorentz, Irwin, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 533,185, Sep. 19, 1983, abandoned. This application Jan. 14, 1985, Ser. No. 691,360
Int. Cl.⁴ C02F *1/32, 1/70;* C23F *11/06*
U.S. Cl. 210—748 **7 Claims**



1. In a process for removing dissolved oxygen from an aqueous medium used in a steam generation system including a steam generator, a condenser having a hotwell, and recycle lines therebetween, and wherein hydrazine is added to the aqueous medium to react with said dissolved oxygen, the improvement comprising:

adding said hydrazine to the aqueous medium, in an amount of up to about 150 parts per billion in excess of that required to react with the dissolved oxygen in the aqueous medium, after passage through the steam generator and prior to passage thereof through the condenser, where condensate is formed and passes to the condenser hotwell, said aqueous medium having a pH between 8.5 to 10.5, to provide contact between the hydrazine and dissolved oxygen in the aqueous medium, without the addition of chemical additives or catalysts for the hydrazine that could lead to decomposition products in said aqueous medium;

exposing the hydrazine-containing aqueous medium condensate formed in the condenser to ultraviolet light in the condenser hotwell for a period of time sufficient to effect removal of the dissolved oxygen by the hydrazine, whereby the hydrazine reacts more readily with oxygen in the condenser and will not be taken into the steam generator; and

recycling the aqueous medium condensate for use in the steam generator.

4,557,836
SOLID DISCHARGE MECHANISM FOR DEWATERING SYSTEM

Gerald A. Croopnick, Trabuco Canyon, and John M. Zabsky, Santa Ana, both of Calif., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Dec. 21, 1981, Ser. No. 332,458
Int. Cl.⁴ B01D *33/06*
U.S. Cl. 210—287 **14 Claims**

1. In an apparatus for centrifugally separating fluid-entrained particles, which include walls forming a circular chamber that rotates about its axis, and forming a ring-like passageway extending from the chamber, the improvement comprising:

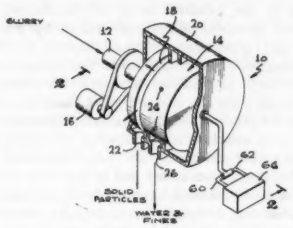
a pair of concentric but radially-spaced ring-like gates;

an actuator assembly connected to said gates to move them axially forward across said passageway and rearwardly to retract them therefrom; and

control means for operating said actuators assembly to move said gates in a predetermined sequence that isolates and then releases material lying in the passageway between the gates.

10. A method for centrifugally separating fluid-entrained particles from the fluid, comprising:

feeding said fluid into a rotating vessel that includes a chamber, a screening device at a side of the chamber that is closest to the axis of rotation for passing primarily fluid, and a passageway extending from the side of the chamber that is furthest from the axis of rotation, so that larger particles tend to settle into the passageway;



leaving open an inner first location of said passageway which is closest to said chamber, while blocking a second passageway location outward therefrom, to build up a mass of particles inwardly of said second location;

at intervals when a mass of particles of a height larger than the distance between said locations has built up behind said second location, closing said inner passageway location, then opening said second outer location to discharge a mass of particles, then closing the outer passageway location, and then opening the inner passageway location to allow another buildup of particles.

4,557,837
SIMULATION AND CLEANUP OF OIL- AND/OR GAS-PRODUCING WELLS

Henry B. Clark, III, Oakdale, and Myron T. Pike, Stillwater, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sep. 15, 1980, Ser. No. 187,439
Int. Cl.⁴ E21B *43/27, 43/25*
U.S. Cl. 252—8.55 C **16 Claims**

1. In a method for treating an oil- and/or gas-bearing formation by injecting therein a substantially water-free methanol-containing well treatment fluid, the improvement comprising adding to said fluid an amount, sufficient to make said fluid foamable, of polymer comprising:

(a) a polymeric backbone;

(b) three or more fluorine-containing moieties of the formula R_fQ attached to said backbone, wherein R_f is a monovalent, fluorinated aliphatic radical terminating in at least one perfluoromethyl group and having 5 to 14 carbon atoms, and Q is a linkage or bridge through which R_f is attached to said backbone; and

(c) two or more moieties of the formula AQ′ attached to said backbone, wherein A is a polar methanol-solubilizing group, Q′ is a linkage or bridge through which A is attached to said backbone, greater than about 10% by weight AQ′ moieties are present in said polymer, and AQ′ is a radical which, when the valence bonds of AQ′ are satisfied by hydrogen atoms, has a solubility in methanol at 25° C. of at least about 20% by weight;

said polymer containing between about 25 to about 50% by weight fluorine and having a number average molecular weight below about 100,000, and a 1 weight percent solution of said polymer in reagent grade methanol having at 25° C. a foam quality of at least about 60 and a foam half-life of at least about 50 seconds.

4,557,838

INHIBITING ACID CORROSION OF METALS

James D. Nichols, Glenmoore; Richard Derby, Media; Glenn T. von dem Bussche, Wescosville, and David A. Hannum, Chadds Ford, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Continuation-in-part of Ser. No. 366,640, Apr. 8, 1982, abandoned. This application Sep. 24, 1984, Ser. No. 653,993

Int. Cl.[4] C23F *11/04*

U.S. Cl. 252—8.55 C 20 Claims

1. A corrosion inhibitor composition consisting essentially of (a) at least one amine by-product mixture which is (1) that obtained in the production of ethylamine by the catalytic reaction of ammonia and ethanol and comprises an alkyl pyridine, an alkyl piperidine and an alkylamine, (2) that obtained in the production of isopropylamine by the reacton of ammonia with isopropyl alcohol or isopropyl chloride and comprises predominantly mono-, di- and trialkylamines, or (3) that obtained in the production of triethylenediamine by the catalytic condensation reaction of aminoethyl piperazine or hydroxyethyl piperazine and comprises N-hydroxyethyl and N-aminoethyl substituted piperazines and at least one alkyl piperazine, (b) an acetylenic alcohol having 6 to 10 carbon atoms, and (c) dibutyl thiourea, components (a) and (b) present in a weight ratio ranging from 5:1 to 1:5 and the weight amount of component (c) being less than the weight amount of component (a) and component (b) individually.

4,557,839

SYNERGISTIC LUBRICANT ADDITIVES OF ANTIMONY THIOANTIMONATE AND MOLYBDENUM DISULFIDE OR GRAPHITE

Paul Tubbs, Philadelphia, and James King, Lansdale, both of Pa., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed Dec. 21, 1984, Ser. No. 685,196

Int. Cl.[4] C10M *1/54*

U.S. Cl. 252—23 7 Claims

1. A lubricating composition consisting essentially of, by weight, from about 60 to about 99.8% of a lubricant selected from the group consisting of a grease, a mineral oil of lubricating viscosity, and a synthetic fluid of lubricating viscosity and a synergistic mixture of from about 0.1 to about 20% of $SbSbS_4$ and from about 0.1 to about 20% of a member selected from MoS_2 or graphite wherein said $SbSbS_4$ and said member are in a ratio of from about 1 to 9 to 9 to 1.

4,557,840

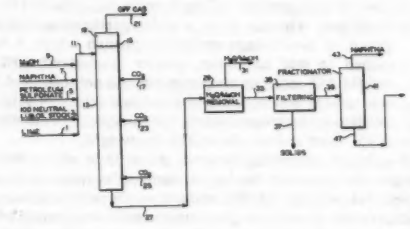
CONTINUOUS PROCESS FOR OVERBASING PETROLEUM SULFONATE IN A PIPE REACTOR WITH MULTIPLE ENTRY OF COUNTERCURRENT CARBON DIOXIDE

Douglas S. Jack, Bartlesville, Okla., and Homer J. Sarrett, Jr., deceased, late of Bartlesville, Okla. (by Vivian Sarrett, Administratrix), assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 11, 1984, Ser. No. 609,366

Int. Cl.[4] C10M *1/40*

U.S. Cl. 252—33.2 6 Claims



1. A method for the continuous overbasing of petroleum sulfonate comprising contacting in a vertical pipe reactor at reaction conditions a downflow of a reaction mixture comprising (1) neutral petroleum sulfonate, (2) 100 neutral lube oil stock, (3) lime $Ca(OH)_2$, (4) MeOH, and (5) naphtha with a counterflow of CO_2 introduced at a multiplicity of feed points along the length of the reactor below the reaction mixture inlet and collecting overbased petroleum sulfonate reaction product as reactor effluent.

5. An apparatus for the continuous overbasing of petroleum sulfonate comprising:

(a) a vertical pipe reactor;

(b) means for maintaining a vapor space over a liquid level in said reactor;

(c) means below said liquid level for inlet of feedstock comprising (i) neutral petroleum sulfonate, (ii) 100 neutral lube oil stock, (iii) calcium hydroxide, (iv) methanol and (v) naphtha;

(d) multiple means below the reaction mixture inlet for controlled inlet of CO_2 along the length of said pipe reactor;

(e) means to remove off gas from the top of said reactor; and

(f) means to remove reaction product from the base of said pipe reactor.

4,557,841

LUBRICANT ADDITIVE CONCENTRATE

George Arndt, Newbury Park, Calif., assignor to Wynn Oil Company, Fullerton, Calif.

Filed Nov. 13, 1984, Ser. No. 671,116

Int. Cl.[4] C10M *1/48*

U.S. Cl. 252—32.7 E 8 Claims

1. A crankcase motor oil additive concentrate intended to be added to a conventional crankcase motor oil to improve its ability to lubricate and protect the engine, said additive concentrate comprising the following components:

(a) a petroleum base stock of lubricating quality and viscosity said base stock comprising from about 25 to 90 weight percent of the additive concentrate;

(b) a detergent-inhibitor package, said package being present at from about 7 to about 40 weight percent of the concentrate;

(c) a supplemental antiwear additive selected from the salts of dialkyl dithiophosphoric acids, said additive being present at a level of from about 1 to about 5 weight percent of the concentrate;

(d) a supplemental antiwear additive selected from the class of sulfurized olefins, said additive being present at a level of from about 1 to about 5 weight percent of the concentrate;

(e) a corrosion inhibitor selected from the class of overbased sulfonates, said inhibitor being present at about 1 to about 5 weight percent of the concentrate; and

(f) jojoba oil present in an amount of from about 0.1 to about 10 weight percent of the concentrate.

4,557,842

ALUMINUM SOAP GREASES

Charles E. Pratt, Bethlehem, Pa., assignor to Joseph Ayers, Inc., Bethlehem, Pa.

Continuation-in-part of Ser. No. 519,560, Aug. 2, 1983, Pat. No. 4,525,307. This application Jun. 19, 1985, Ser. No. 746,537

Int. Cl.[4] C10M *5/12, 7/16*

U.S. Cl. 252—37.7 9 Claims

1. A lubricating grease containing an aluminum complex soap prepared by reacting (1) one molar part of a modified aluminum isopropoxide wherein about 0.125 to about 0.50 mole of isopropoxide, per atom of aluminum, is replaced with an alkoxide of a C_6–to C_{18}- alcohol, with (2) from 1 to 2.5 molar parts of a mixture of a C_7–C_{28} aromatic acid and a C_8–C_{28} aliphatic acid wherein the molar ratio of aromatic to aliphatic acid is between 0.2:1 and 1.5:1, in a lubricating oil base stock, and then reacting this product with (3) water.

4,557,843

BORON-CONTAINING HETEROCYCLIC COMPOUNDS AND LUBRICATING COMPOSITIONS CONTAINING THE SAME

Richard A. Holstedt, Whittier, and Peter J. Jessup, Santa Ana, both of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

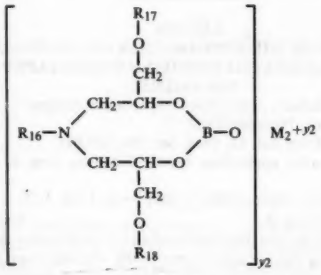
Continuation-in-part of Ser. No. 476,513, Mar. 1, 1983, Pat. No. 4,533,489, and a continuation-in-part of Ser. No. 525,720, Aug. 23, 1983, abandoned, which is a continuation-in-part of Ser. No. 319,073, Nov. 9, 1981, Pat. No. 4,410,436, which is a continuation-in-part of Ser. No. 329,384, Dec. 10, 1981, Pat. No. 4,427,560, which is a continuation-in-part of Ser. No. 329,385, Dec. 10, 1981, which is a continuation-in-part of Ser. No. 333,998, Dec. 23, 1981, Pat. No. 4,412,928, which is a continuation-in-part of Ser. No. 434,602, Oct. 15, 1982, Pat. No. 4,490,265, which is a continuation-in-part of Ser. No. 476,513, Mar. 1, 1983, Pat. No. 4,533,480. This application Jan. 29, 1985, Ser. No. 696,024

The portion of the term of this patent subsequent to Aug. 6, 2002, has been disclaimed.

Int. Cl.[4] C10M *1/20, 1/32, 1/54*

U.S. Cl. 252—46.4 **7 Claims**

1. A compound of the formula:



wherein:

y_2 is an integer from 1 to 4;

M_2 is an organic or inorganic radical or metal or hydrogen;

R_{16} is an inorganic or C_1–C_{50} organic radical; and

R_{17} and R_{18} are the same or different C_1–C_{50} organic radical.

4. A lubrication composition comprising a major amount of a lubricating oil and a minor amount of the compound of the claim 1.

4,557,844

AMINATED BORON- AND PHOSPHORUS-CONTAINING COMPOUNDS AND LUBRICANT OR FUEL COMPOSITIONS CONTAINING SAME

Andrew G. Horodysky, Cherry Hill, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 30, 1984, Ser. No. 575,362

Int. Cl.[4] C10M *1/54;* **C07F** *9/02*

U.S. Cl. 252—49.9 **24 Claims**

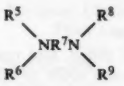
1. A product of reaction made by reacting phosphorus pentoxide, a vicinal diol, of the formula $R(OH)_2$ wherein R is a hydrocarbyl group containing 8 to 30 carbon atoms, a boron compound selected from the group consisting of boric oxide, a metaborate or boron compounds having the formula

$$(R^1O)_xB(OH)_y$$

wherein R^1 is a C_1 to C_6 alkyl group and x and y are each 0 to 3, their sum being 3, and a hydrocarbylamine having one of the following formulae:

$$R^2R^3R^4N$$

and



wherein R^2 is a C_2 to C_{30} hydrocarbyl group, R^3 and R^4 are hydrogen or a C_1 to C_{20} hydrocarbyl group, R^5 is a C_{12} to C_{20} hydrocarbyl group, R^7 is a C_1 to C_4 alkylene group and each of R^6, R^8 and R^9 is selected from hydrogen or a C_1 to C_{20} hydrocarbyl group.

10. A lubricant composition comprising a major proportion of a lubricant and between about 0.1 and about 10% by weight of the total composition of a product of reaction made by reacting phosphorus pentoxide, a vicinal diol, of the formula

$$(R(OH)_2$$

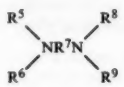
wherein R is a hydrocarbyl group containing 8 to 30 carbon atoms, a boron compound selected from the group consisting of boric oxide, a metaborate or a boron compound having the formula

$$(R^1O)_xB(OH)_y$$

wherein R^1 is a C_1 to C_6 alkyl group and x and y are each 0 to 3, their sum being 3, and a hydrocarbylamine having one of the following formulae:

$$R^2R^3R^4N$$

and



wherein R^2 is a C_2 to C_{30} hydrocarbyl group, R^3 and R^4 are hydrogen or a C_1 to C_{20} hydrocarbyl group, R^5 is a C_{12} to C_{20} hydrocarbyl group, R^7 is a C_1 to C_4 alkylene group and each of R^6, R^8 and R^9 is selected from hydrogen or a C_1 to C_{20} hydrocarbyl group.

4,557,845

ALKOXYLATED AMINE-PHOSPHITE REACTION PRODUCT AND LUBRICANT AND FUEL CONTAINING SAME

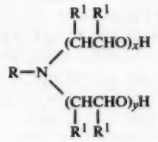
Andrew G. Horodysky, Cherry Hill, and Phillip S. Landis, Woodbury, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 14, 1983, Ser. No. 561,413

Int. Cl.[4] C10M *1/32, 1/46*

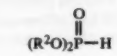
U.S. Cl. 252—49.9 **25 Claims**

1. A product of reaction made by reacting (1) an alkoxylated amine of the formula



wherein R is a C_6 to C_{30} hydrocarbyl group, R^1 is hydrogen or a C_1 to C_6 hydrocarbyl group, and x and y are integers of from

0 to 10, at least one of which is not 0 with (2) a phosphite of the formula



wherein R^2 is a C_1 to C_6 hydrocarbyl group, said reacting being carried out at a temperature between about 80° C. and about 200° C. and in reactant proportions such that from about 5 percent to about 100 percent of the amine hydroxy groups are reacted with said phosphite.

4,557,846

LUBRICATING OIL COMPOSITIONS CONTAINING HYDROXAMIDE COMPOUNDS AS FRICTION REDUCERS

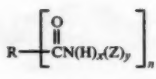
Max J. Wisotsky, Highland Park, N.J., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Dec. 30, 1983, Ser. No. 567,247

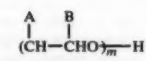
Int. Cl.[4] C10M *1/36*

U.S. Cl. 252—51.5 A **17 Claims**

1. A lubricating oil composition having improved friction reducing properties comprising a major amount of lubricating base oil and from about 0.01 to about 2.0 percent by weight of a hydroxyamide compound having the formula:



where R is the hydrocarbon radical of dimer carboxylic acid having a total of about 24 to about 90 carbon atoms with about 9 to about 42 carbon atoms between carboxylic acid groups and Z is (a) a hydroxy substituted alkyl group having about 1 to about 20 carbon atoms or (b) an oxyalkylene group of the formula:



where A and B are each alkyl of 1 to 2 carbon atoms or hydrogen and m is an integer of 1 to 50; x is 0 or 1; y is 1 or 2 and n is 2.

4,557,847

ETHYLENE COPOLYMER VISCOSITY INDEX IMPROVER-DISPERSANT ADDITIVE USEFUL IN OIL COMPOSITIONS

Antonio Gutierrez, Mercerville; Darrell W. Brownawell, and Ricardo Bloch, both of Scotch Plains, all of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Nov. 21, 1983, Ser. No. 553,410

Int. Cl.[4] C10M *1/36*

U.S. Cl. 252—51.5 A **21 Claims**

1. Oil soluble reaction product, useful as a V.I.-dispersant for lubricating oil, comprising the reaction product of:

(a) an oil soluble ethylene copolymer comprising within the range of about 15 to 90 wt. % of ethylene and about 10 to 85 wt. % of one or more C_3 to C_{28} alpha-olefin, having a number average molecular weight within a range of about 5,000 to 500,000 and grafted with an ethylenically unsaturated carboxylic acid material having 1 to 2 carboxylic acid groups or anhydride groups;

(b) an alkylene or oxyalkylene amine having at least two primary amine groups; and,

(c) a branched mono-carboxylic acid of the formula RCOOH where R is a hydrocarbyl group of 20 to 148 carbon atoms having a total of 2 to 6 branches of 8 to 24 carbon atoms each.

4,557,848

CRANKCASE LUBRICANT

Rodney L. Sung, Fishkill; Benjamin H. Zoleski, Beacon; William M. Sweeney, Wappingers Falls, all of N.Y., and Wheeler C. Crawford, Houston, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Dec. 8, 1983, Ser. No. 559,566

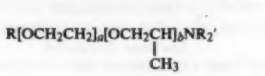
Int. Cl.[4] C10M *1/32*

U.S. Cl. 252—51.5 R **14 Claims**

1. A crankcase lubricating oil composition suitable for use in a slow-speed marine diesel engine crankcase comprising

(i) a major portion of a mineral lubricating oil suitable for use as lubricant in the crankcase of a marine diesel engine; and

(ii) a minor, effective rust-inhibiting amount of



wherein R is alkyl, aralkyl, alkaryl, aryl, or cycloalkyl, R' is hydrogen or alkyl, a is 1–10, and b is 1–15.

4,557,849

PROCESS FOR THE PREPARATION OF OIL-SOLUBLE HYDROGENATED MODIFIED STAR-SHAPED POLYMERS

Rudolf J. A. Eckert, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Jul. 13, 1984, Ser. No. 630,914

Claims priority, application United Kingdom, Aug. 4, 1983, 8321007

Int. Cl.[4] C08F *293/00*; C10M *1/32, 3/26, 5/20*

U.S. Cl. 252—51.5 R **9 Claims**

1. A process for the preparation of an oil-soluble, star-shaped product having viscosity index-improving and dispersant properties, comprising modifying a hydrogenated star-shaped polymer comprising a nucleus and polymeric arms linked to said nucleus, wherein said arms are selected from the group consisting of:

(i) hydrogenated homopolymers and hydrogenated copolymers of conjugated dienes;

(ii) hydrogenated copolymers of conjugated dienes and mono-alkenyl arenes; and

(iii) mixtures thereof;

wherein at least about 80% of the aliphatic unsaturation of the star-shaped polymer has been reduced by hydrogenation while less than 20% of the aromatic unsaturation has been reduced, wherein the hydrogenated polymer is metallated with an organolithium compound in the presence of a metallation promoter, and subsequently reacted with

(a) a vinyl pyridine.

8. A product prepared according to the process of claim 1.

9. An oil composition, in particular a lubricating oil composition or concentrate comprising an oil and 0.001–45%w of the product of claim 8.

4,557,850

COMPOSITION FOR ABSORPTION REFRIGERATION

Eiji Ando, Katano; Yoshiki Goto, Nara; Kumiko Moriyama, Hirakata; Isao Takeshita, Neyagawa, and Kunio Hirao, Kadoma, all of Japan, assignors to Matsushita Electric Industrial Company, Limited, Osaka, Japan

Filed Apr. 7, 1982, Ser. No. 367,034

Claims priority, application Japan, Apr. 7, 1981, 56-52716; Apr. 7, 1981, 56-52717

Int. Cl.[4] C09K *5/04*

U.S. Cl. 252—68 **17 Claims**

1. An absorption refrigeration composition comprising a

fluorinated hydrocarbon serving as a refrigerant, an amide as an absorbent, and a phosphite compound contained in an amount of 0.05 to 0.5 wt %, calculated as phosphorus, of said absorbent.

4,557,851

WORKING FLUIDS FOR THE RANKINE CYCLE COMPRISING TRICHLOROFLUOROMETHANE AND 1,1-DIFLUOROETHANE, ISOBUTANE OR OCTAFLUOROCYCLOBUTANE

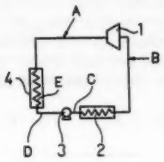
Naonori Enjo, Suita; Masahiro Noguchi, Osaka, and Satoshi Ide, Settsu, all of Japan, assignors to Daikin Kogyo Co., Ltd., Japan

Continuation of Ser. No. 511,584, Jul. 7, 1983, abandoned. This application Jul. 20, 1984, Ser. No. 632,276

Claims priority, application Japan, Jul. 14, 1982, 57-123441; Jul. 14, 1982, 57-123440; Jul. 14, 1982, 57-123439

Int. Cl.[4] C09K *3/18, 5/04;* **C01B** *2/00;* **F01K** *27/00*

U.S. Cl. 252—70 **2 Claims**



1. Working fluids for the Rankine cycle comprising about 95 to about 50% by weight of trichlorofluoromethane and about 5 to about 50% by weight of a member selected from the group consisting of 1,1-difluoroethane, isobutane and octafluorocyclobutane.

4,557,852

POLYMER SHEET FOR DELIVERING LAUNDRY CARE ADDITIVE AND LAUNDRY CARE PRODUCT FORMED FROM SAME

Gerald O. Schulz, and Thomas D. Gueldenzopf, both of Racine County, Wis., assignors to S. C. Johnson & Son, Inc., Racine, Wis.

Filed Apr. 9, 1984, Ser. No. 598,103

Int. Cl.[4] C11D *7/54;* **A01N** *3/00*

U.S. Cl. 252—95 **7 Claims**

1. A laundry care product which comprises a particulate laundry care additive carried in a water soluble sheet which comprises a self-supporting film of an addition polymer formed of:

(a) From about 40 to 95% by weight of a water insoluble soft monomer;

(b) From about 3 to 15% by weight of a water soluble anionic monomer;

(c) From about 0 to 25% by weight of a water soluble nonanionic monomer;

(d) From about 0 to 40% by weight of a water insoluble hard monomer

wherein said addition polymer is at least about 75% neutralized with a group 1A metal base or a group 1A metal basic salt.

4,557,853

SKIN CLEANSING COMPOSITIONS CONTAINING ALKALINE EARTH METAL CARBONATES AS SKIN FEEL AGENTS

Royal D. Collins, Bethel, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Aug. 24, 1984, Ser. No. 643,913

Int. Cl.[4] C11D *13/14, 17/00*

U.S. Cl. 252—128 **9 Claims**

1. A skin cleansing composition, in the form of a toilet bar, comprising:

A. from about 50% to about 90% of a surfactant or mixture of surfactants selected from the group consisting of soap and anionic, nonionic, amphoteric and zwitterionic synthetic detergents; and

B. from about 1.5% to about 10% of a particulate alkaline earth metal carbonate having a particle size of from 0.03 to about 50 microns;

the weight ratio of (A) to (B) in said composition being from about 16:1 to about 40:1.

4,557,854

DETERGENT COMPOSITIONS CONTAINING INSOLUBLE PARTICULATES WITH A CATIONIC SURFACE TREATMENT

Edwin P. Plueddemann, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Mar. 2, 1984, Ser. No. 585,747

Int. Cl.[4] C11D *9/36*

U.S. Cl. 252—174.15 **8 Claims**

1. A laundry detergent composition comprising

(A) from 2 percent to 90 percent by weight of an organic surface active agent and

(B) from 10 percent to 98 percent by weight of a particulate material that

(a) remains solid and substantially insoluble in water to a temperature of 90° C.;

(b) has an average particle size from 0.1 to 100 micrometers;

(c) has a surface modified by an organosilicon compound represented by the general formula

$$O_{(3-n)/2}(RO)_nSiR'N^+R_3''.X^-$$

wherein R is an alkyl radical of 1 to 3 carbon atoms; R' is a divalent radical that attaches a quaternary nitrogen atom to a silicon atom, contains 3 to 10 carbon atoms, is selected from the group consisting essentially of alkylene radicals, radicals composed of carbon, hydrogen and oxygen, radicals composed of carbon, hydrogen and sulfur, and radicals composed of carbon, hydrogen and nitrogen, and is attached to the silicon atom at least 3 carbon atoms removed from the quaternary nitrogen atom or any oxygen, sulfur or nitrogen atom in the divalent radical; R'' is a monovalent radical containing 1 to 8 carbon atoms and is independently selected from the group consisting essentially of alkyl radicals, arylalkyl radicals, and substituted alkyl radicals with amino, hydroxyl, or hydrocarbonoxy substituents; X is a halogen or hydroxyl anion; and n has a value from 0 to 3.

4,557,855

SURFACE ACTIVE AGENT COMPOSITIONS

Gheorghe Cioca, Coatesville, Pa.; Marcel Siegier, North Bergen, N.J., and Apostol Spiliadis, Frazer, Pa., assignors to Seton Company, Newark, N.J.

Division of Ser. No. 479,715, Mar. 28, 1983, Pat. No. 4,494,994. This application Oct. 24, 1984, Ser. No. 664,301

Int. Cl.[4] B01F *17/00;* **C09K** *3/00*

U.S. Cl. 252—355 **6 Claims**

1. A surface active agent comprising:

lignin sulfonic acids and a polypeptide having a molecular weight of about 2,500 to about 15,000, wherein said poly-

peptide is present at a level of about 4% by weight to about 50% by weight and said lignin sulfonic acids are present at a level of about 50% by weight to about 96% by weight on a solids basis.

4,557,856

ELECTRICALLY CONDUCTIVE COMPOSITION FOR ELECTRO-RESPONSIVE RECORDING MATERIALS

Nobuhiro Miyakawa, Kobe; Hiroshi Kokado, and Eiichi Inoue, both of Tokyo, all of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Feb. 15, 1979, Ser. No. 12,289

Claims priority, application Japan, Feb. 18, 1978, 53/17118; Feb. 20, 1978, 53/17701

Int. Cl.[4] H01B *1/00*

U.S. Cl. 252—500 **27 Claims**

1. An electrically conductive composition for an electro-responsive recording material, which comprises a protonically conductive compound which is a solid electrolyte having a proton as the mobile ion, a finely divided inorganic solid acid having characteristics of a Bronstead acid or Lewis acid and a binder which is a water-soluble water-dispersible or organic solvent-soluble organic polymer, wherein the mixing weight ratio of the protonically conductive compound to the finely divided inorganic solid acid is in the range of from 0.5:100 to 100:100 and the amount of the binder is 10 to 500% by weight based on the total amount of the protonically conductive compound and finely divided inorganic solid acid.

13. A composition for formation of an electrically conductive recording layer, which comprises (A) a protonically conductive compound which is a solid electrolyte having a proton as the mobile ion, (B) a finely divided inorganic solid acid having characteristics of a Bronstead acid or Lewis acid (C) a binder which is a water-soluble, water-dispersible or organic solvent-soluble organic polymer, and (D) a color former capable of color formation by introduction of different ions, discharge of ions, oxidation or reduction, change of the pH or Joule's heat, wherein the mixing weight ratio of the protonically conductive compound to the finely divided inorganic solid acid is in the range of from 0.5:100 to 100:100, the amount of the binder is 10 to 500% by weight based on the total amount of the protonically conductive compound and finely divided inorganic solid acid, and the color former is present in an amount of 2 to 40% by weight based on the total amount of the protonically conductive compound, finely divided inorganic solid acid and binder.

4,557,857

HIGH CONDUCTING POLYMER-METAL ALLOY BLENDS

Ian W. Sorensen, Bloomfield Hills, Mich., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed May 30, 1984, Ser. No. 615,491

Int. Cl.[4] C08K *3/08;* **H01B** *1/02*

U.S. Cl. 252—503 **18 Claims**

1. A high conducting polymer-metal alloy comprising:

at least a first quantity of a polymer having a Non-Newtonian rheological behavior exhibiting a determinable viscosity at a predetermined blending temperature and a predetermined shear stress blending rate; and

at least a second quantity of a low melting temperature metal alloy blended with said first quantity of said polymer at said predetermined blending temperature and said predetermined shear stress rate to form an interpenetrating polymer-metal alloy network.

4,557,858

METHOD OF MAKING AN ELECTRONICALLY CONDUCTIVE TECTOSILICATE, AND SUCH TECTOSILICATE WHEN MADE ACCORDING TO THE METHOD

Roy C. Galloway, Pretoria, South Africa, assignor to Lilliwyte Societe Anonyme, Luxembourg

Filed Mar. 14, 1983, Ser. No. 474,989

Claims priority, application South Africa, Apr. 15, 1982, 82/2573

Int. Cl.[4] H01B *1/16;* **C01B** *33/28, 33/32*

U.S. Cl. 252—508 **16 Claims**

1. A method of making an electrode for an electrochemical cell which comprises precipitating a tectosilicate selected from the group consisting of zeolites, felspathoids, felspars and silica gel from a solution which has an electronically conductive species selected from the group consisting of carbon, the transition metal chalcogenides, intercalation compounds of carbon and intercalation compounds of said chalcogenides in colloidal form in suspension therein, so that the colloidal particles of the electronically conductive species are trapped within the framework structure of the precipitate, and sorbing an electrochemically active electrode substance which comprises one or more elements selected from the group consisting of the halogens, the alkali metals, the alkaline earth metals, the first and second series of transistion elements, lead, phosphorous, arsenic, antimony, bismuth, aluminium, oxygen, sulphur and selenium into the internal volume of the tectosilicate, so that the electrochemically active substances is sorbed and held captive therein dispersed form for effective use in an electrochemical cell.

4,557,859

VULCANIZED OLEFIN-BASED RUBBER COMPOSITION

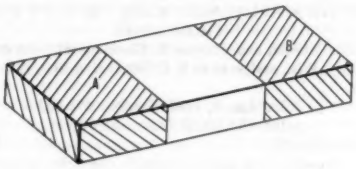
Masahiko Maeda, Tokyo; Naotochi Watanabe, and Kenji Fujitani, both of Kanagawa, all of Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 18, 1983, Ser. No. 514,899

Claims priority, application Japan, Jul. 16, 1982, 57-122971; Jul. 16, 1982, 57-122972

Int. Cl.[4] H01B *1/06*

U.S. Cl. 252—511 **17 Claims**



1. An olefin-based rubber composition, comprising:

(A) 40 to 90 wt % of an olefin-based rubber consisting essentially of ethylene and propylene; and

(B) 5 to 55 wt % of a metal selected from the group consisting of aluminum and an aluminum alloy in a form selected from the group consisting of powder, fiber, and flake; and

(C) 5 to 55 wt % of electrically-conductive carbon black, the total quantity of the aluminum powder and the electrically-conductive carbon black being 10 to 60 wt % in the composition, said composition being vulcanized with a sulfur-containing substance.

4,557,860

SOLVENTLESS, POLYIMIDE-MODIFIED EPOXY COMPOSITION

Anthony L. DiSalvo, Greenwich, Conn., and Ki-Soo Kim, Katonah, N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Jul. 6, 1984, Ser. No. 628,541
Int. Cl.[4] H01B *1/02*
U.S. Cl. 252—512 9 Claims

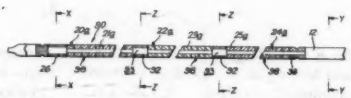
1. A polyimide-modified epoxy adhesive composition which comprises: (a) an epoxy resin; (b) a soluble polyimide resin; and (c) a reactive monoepoxy diluent to dissolve the soluble polyimide resin into the epoxy resin, the soluble polyimide resin comprising from about 0.01% to about 20% by weight of epoxy, polyimide and diluent.

4,557,861

NUCLEAR FUEL CARTRIDGE, AND A METHOD OF PREPARING THE CARTRIDGE FOR THE EXTRACTION OF NUCLEAR MATERIAL THEREFROM

Thomas D. Hodgson, Abingdon, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed Mar. 5, 1982, Ser. No. 355,182
Claims priority, application United Kingdom, Mar. 13, 1981, 8108042
Int. Cl.[4] G21C *19/44, 3/18*
U.S. Cl. 252—627 18 Claims



1. A method of extracting nuclear material from a nuclear fuel cartridge, said cartridge comprising a sheath and nuclear material in the sheath defining at least in part an axial passageway for liquid extending from one end to the other end of the nuclear material, said sheath including regions therein free of nuclear material at each end of the nuclear material for providing access for a dissolvent for the nuclear material into the passageway during reprocessing of the cartridge, said method comprising cutting the cartridge at the regions free of nuclear material such as to provide access to the passageway suitable to permit circulation therethrough of a dissolvent for the nuclear material, and circulating a dissolvent through said passageway to extract soluable nuclear material therefrom.

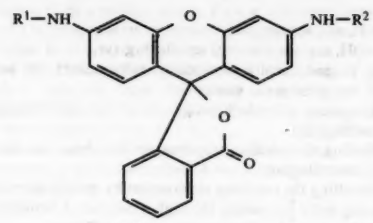
4,557,862

RHODAMINE DERIVATIVES AS FLUOROGENIC SUBSTRATES FOR PROTEINASES

Walter F. Mangel, Urbana, Ill.; Stephen Leytus, Seattle, Wash., and L. Lee Melhado, Urbana, Ill., assignors to University Patents, Inc., Westport, Conn.

Filed Oct. 28, 1983, Ser. No. 546,718
Int. Cl.[4] C07G *7/00;* C07D *493/10*
U.S. Cl. 260—112 R 10 Claims

1. A compound of the formula:



wherein R^1 and R^2, which are the same or different, are selected from the group consisting of amino acids, amino acid derivatives, blocked amino acids, blocked amino acid derivatives, and peptides.

4,557,863

DEVICE FOR COLLECTION OF PROTEINS IN A URINAL AND METHOD OF USE

Denis M. Callewaert, 1600 Hosner Rd., Oxford, Mich. 48051, and Earl J. Braxton, 46731 Shelby Rd., Utica, Mich. 48087

Filed Apr. 13, 1984, Ser. No. 600,081
Int. Cl.[4] C07G *7/00, 7/026*
U.S. Cl. 260—112 R 21 Claims

1. A device for installation in a urinal useful for collection of urinary proteins, comprising an open ended columnar conduit for gravity feed passage of urine streams therethrough, and first and second urine stream permeable layers in the conduit, the first and second layers containing respectively (1) a leachable water soluble hydrophilic component comprising an antimicrobial agent and (2) an adsorbent for urinary proteins, the water soluble hydrophilic component including a water soluble antimicrobial that is leached ratably by exposure to intermittent urine streams and a water insoluble hydrophobic component that sublimes ratably to the air thereby gradually exposing the hydrophilic component for slow release, the respective rates of leaching and subliming during the service life being chosen such that the leaching of antimicrobial from the first layer into the second layer is sufficient to provide an inhibitor concentration effectively inhibiting microbial degradation of wanted proteins contained in the adsorbate of the second layer.

13. A method of collecting urine proteins comprising the steps of installing in a urinal the device according to claim 1 comprising a conduit and first and second urine-stream permeable layers in the conduit and subjecting the permeable layers of the conduit to contact with air and intermittent flow of gravity-fed urine streams under conditions affording leaching of the antimicrobial agent from the first layers into each of the urine streams and adsorption onto the second layer of urinary proteins from each of the resulting leachate streams thereby isolating the resulting adsorbed urinary proteins as a recoverable solid phase adsorbate in the second layer in which layer the antimicrobial leachate inhibits degradation of the adsorbed protein.

4,557,864

ATRIAL PEPTIDES

Philip Needleman, Olivette, Mo., assignor to Washington University, St. Louis, Mo.

Division of Ser. No. 569,684, Jan. 10, 1984, Pat. No. 4,496,544, and a continuation-in-part of Ser. No. 551,372, Nov. 10, 1983, abandoned. This application Jul. 26, 1984, Ser. No. 634,858
Int. Cl.[4] C07C *103/52*
U.S. Cl. 260—112.5 R 1 Claim

1. A process for preparing a peptide having the amino acid sequence

R_1-cys-phe-gly-gly-arg-ile-asp-arg-ile-gly-ala-gln-ser-gly-leu-gly-cys-asn-R_2

wherein

R_1=H, ser, ser-ser, and

R_2=OH, ser, ser-phe-arg, ser-phe-arg-tyr,

or the physiologically acceptable salts, esters or amides thereof, comprising the steps of:

(a) Preparing a crude homogenate of rat atrial tissue and centrifuging;

(b) Boiling the resulting supernatant for about ten minutes and centrifuging;

(c) Desalting the resulting supernatant by gel filtration chromatography by passing through a column of Sephadex ® G-15 resin and collecting the protein effluent;

(d) Separating the protein effluent into high and low molecular weight protein fractions by gel filtration chromatography by passing through a column of Sephadex ® G-75 resin and collecting the low molecular weight protein fraction;

(e) Separating the low molecular weight fraction into two biologically active protein fractions of preferential spasmolytic activity by ion exchange chromatography by passing through a column of SP-Sephadex ® C-25 resin and collecting the separated low molecular weight fraction which preferentially relaxes intestinal smooth muscle;

(f) Separating the latter low molecular weight fraction into individual peptides of the aforesaid amino acid sequence by subjecting to reversed phase high high performance liquid chromatography on an octadecyl column; and

(g) Recovering any of the separated atrial peptides.

4,557,865

SUBSTITUTED 4-AZATRICYCLO[4.3.1.1^{3,8}]UNDECANE COMPOUNDS

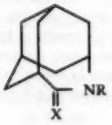
Vassil S. Georgiev, Rochester, and Clyde R. Kinsolving, Fairport, both of N.Y., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed May 7, 1984, Ser. No. 607,378

Int. Cl.^{4} C07D *223/14*

U.S. Cl. 260—239.3 T **16 Claims**

1. A compound having the formula:



Where X is selected from H_2, O, S, and N—NHR', where R' is alkoxycarbonyl, and

Where R is selected from H, H HI, benzoyl, cinnamoyl, propargyl, phenylpropenyl, and 3-[3'-(4''-methylene-4''-azatricyclo[4.3.1.1^{3,8}]undecane)azobenzene]methylene, and 4-[4'-(4''-methylene-4''-azatricyclo[4.3.1.1^{3,8}]undecane)azobenzene]methylene, wherein the benzoyl, cinnamoyl and the phenyl ring of the phenylpropenyl can be substituted with one or more groups selected from alkyl of 1 to 8 carbon atoms, haloalkyl, alkoxy, nitro, amino, hydroxyl, and carboxyl, and

when R is H, X≠H_2 or O and when R is benzoyl, X≠O.

12. A compound according to claim **1** wherein the compound is 4-propargyl-4-azatricyclo[4.3.1.1^{3,8}]undecan-5-one.

4,557,866

PROCESS FOR THE SYNTHESIS OF PYRIDO-IMIDAZO RIFAMYCINS

Vincenzo Cannata, Borgo Nuovo di Pontecchio Marconi, and Gian F. Tamagnone, Casalecchio di Reno, both of Italy, assignors to ALFA Farmaceutici S.p.a., Bologna, Italy

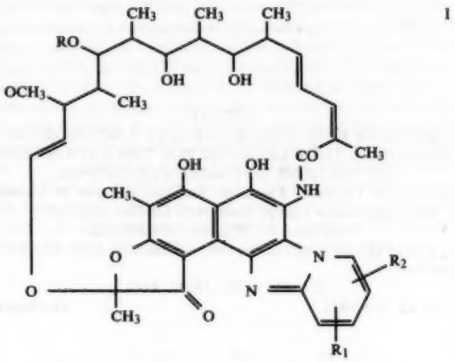
Filed Apr. 26, 1985, Ser. No. 727,521

Claims priority, application Italy, May 15, 1984, 3463 A/84

Int. Cl.^{4} C07D *491/22*

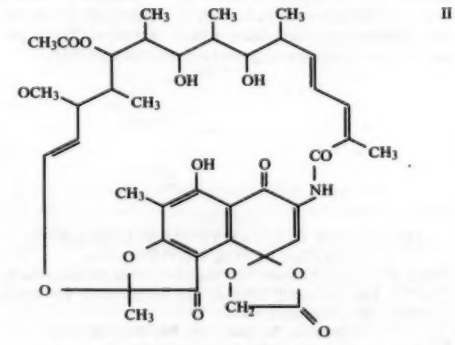
U.S. Cl. 260—239.3 P **4 Claims**

1. A new process for the preparation of pyrido-imidazo rifamycins of formula



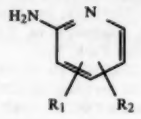
I

wherein R is hydrogen or acetyl, R_1 and R_2 independently represent hydrogen, (C_{1-4})-alkyl, benzyloxy, mono- or di-(C_{1-3})-alkylamino-(C_{1-4})-alkyl, (C_{1-3})-alkoxy-(C_{1-4})-alkyl, hydroxymethyl, hydroxy-(C_{2-4})-alkyl, cyano, halogen, nitro, mercapto, (C_{1-4})-alkylthio, phenylthio, carbamoyl, mono- or di-(C_{1-4})-alkyl-carbamoyl, or R_1 and R_2 taken together with two consecutive carbon atoms of the pyridine nucleus, form a benzene ring optionally substituted by 1 or 2 methyl or ethyl groups, which comprises reacting a molar equivalent of rifamycin O of formula



II

with from about 1 to about 9 molar equivalents of a 2-aminopyridine of formula



III

in the presence of a solvent or a solvent system, at a temperature comprised between about the room temperature and the boiling temperature of the reaction mixture, for a period of time comprised between about 10 and about 100 hours, optionally in presence of iodine or of a system iodide/oxidizing agent, and recovering the end products by means of known techniques.

4,557,867

11β-DIFLUOROMETHYL AND (E)- AND (Z)-11-FLUOROMETHYLENE STERIODS

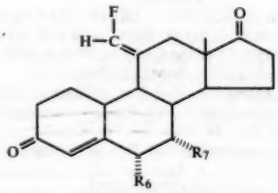
J. Allan Campbell, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 573,787, Jan. 25, 1984, abandoned, which is a continuation-in-part of Ser. No. 561,605, Dec. 14, 1983, abandoned. This application Aug. 8, 1984, Ser. No. 639,285

Int. Cl.[4] C07J *33/00*

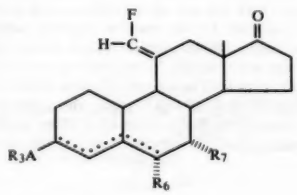
U.S. Cl. 260—239.5 **12 Claims**

5. A (E)-11-fluoromethylene steroid selected from the group consisting of a (E)-11-fluoromethylene-17-keto steroid of the formula



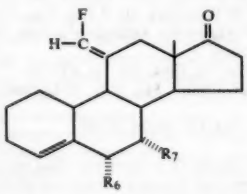
(III)

a C_3 protected (E)-11-fluoromethylene steroid of the formula



(IV')

and a 3-unsubstituted-17-keto-(E)-11-fluoromethylene steroid of the formula



(XII')

where

R_6 is a hydrogen atom or methyl group with the proviso that when R_6 is a methyl group, R_7 is a hydrogen atom; and

R_7 is a hydrogen atom or methyl group with the proviso that when R_7 is a methyl group, R_6 is a hydrogen atom.

6. A (E)-11-fluoromethylene steroid according to claim 5 which is selected from the group consisting of (E)-11-(fluoromethylene)estr-4-ene-3,17-dione, (E)-11-fluoromethylene-7α-methylestr-4-ene-3,17-dione, (E)-11-(fluoromethylene)estr-4-ene-3,17-dione 3-ethanedithiol ketal, and (E)-11-fluoromethylene-7α-methylestr-4-ene-3,17-dione 3-ethanedithiol ketal.

4,557,868

PROCESS FOR PREPARING A PHTHALOCYANINE

Geoffrey A. Page; Emery G. Tokoli; Robert T. Cosgrove, all of Rochester, and John W. Spiewak, Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jun. 26, 1984, Ser. No. 624,652

Int. Cl.[4] C09B *47/04*

U.S. Cl. 260—245.89 **18 Claims**

1. A process for preparing vanadyl phthalocyanine particles for photoresponsive devices comprising reacting vanadium pentoxide with phthalonitrile and an alcohol at least at an exotherm temperature with agitation, said alcohol having a boiling point of at least 180° C.; filtering the resulting reaction mixture to form a reaction product pigment cake; washing said reaction product pigment cake at lest once with a dipolar aprotic solvent to form a treated pigment cake; drying said treated pigment cake; leaching with agitation said treated pigment cake with a strong acid diluted with water; filtering the resulting mixture to form a leached pigment cake; washing said leached pigment cake at least once with a strong acid diluted with water to form a washed leached pigment cake; washing said leached pigment cake at least once with a solvent comprising water to form a water washed leached pigment cake; forming a strong base slurry by combining said washed leached pigment cake with a strong base diluted with water; heating said strong base slurry with agitation; filtering the resulting mixture to form a strong base treated pigment cake; forming a solvent slurry by combining said strong base treated pigment cake with a dipolar aprotic solvent, heating said solvent slurry with agitation; filtering the solvent slurry to obtain a solvent treated pigment cake; forming an aqueous slurry by combining said solvent treated pigment cake with a solvent comprising water; heating said aqueous slurry with agitation; filtering the aqueous slurry to obtain a washed pigment cake; drying said washed pigment cake; incrementally dissolving with agitation said washed pigment cake in a chilled concentrated strong acid to form a chilled concentrated strong acid solution of vanadyl phthalocyanine; incrementally combining with agitation said solution with chilled water to form a mixture comprising precipitated vanadyl phthalocyanine particles; filtering the resulting mixture to obtain a cake of precipitated vanadyl phthalocyanine particles; forming an aqueous slurry by combining said cake of precipitated vanadyl phthalocyanine particles with a solvent comprising water to form a vanadyl phthalocyanine particle water slurry; heating said vanadyl phthalocyanine particle water slurry; filtering the resulting mixture to obtain a cake of vanadyl phthalocyanine particles; forming a water slurry by combining said cake of vanadyl phthalocyanine particles with water; filtering said water slurry to form a purified pigment cake of vanadyl phthalocyanine; and drying said purified pigment cake of vanadyl phthalocyanine.

4,557,869

DIHALO-MONOPHOSPHA-S-TRIAZINES AND THEIR DERIVATIVES

Kazimiera J. L. Paciorek, Corona del Mar; Reinhold H. Kratzer, Irvine; David H. Harris, Sierra Madre; Mark E. Smythe, Pasadena, and James H. Nakahara, Irvine, all of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 19, 1984, Ser. No. 601,874

Int. Cl.[4] C07C *117/00*; C07F *9/26*

U.S. Cl. 260—349 10 Claims

9. The compound 1-diaidophospha-3,5-bis-(perfluoro-n-heptyl)2,4,6-triazine.

4,557,870

NON-EMISSIVE, FLAME-RETARDANT COATING COMPOSITIONS

Stephen D. Rodgers, Bowie, Md.; Richard J. Dick, Columbus, and Vincent D. McGinnis, Delaware, both of Ohio, assignors to Battelle Development Corporation, Columbus, Ohio

Division of Ser. No. 199,843, Oct. 23, 1980, Pat. No. 4,405,761. This application Sep. 29, 1982, Ser. No. 428,248

The portion of the term of this patent subsequent to Nov. 26, 2002, has been disclaimed.

Int. Cl.[4] C09F *5/00, 7/00*; C11C *3/00*

U.S. Cl. 260—404.8 13 Claims

1. A liquid, room-temperature curable, non-emissive, non-flame promoting solvent which comprises a liquid polyhalogenated organic ring compound substituted with a room-temperature curable group selected from the group consisting of an oxirane group, an air-dryable group derived from an air-dryable fatty acid, an air-dryable allyl ether group, and combinations thereof.

4,557,871

NOVEL STYRENE DERIVATIVES OF THE GENERAL FORMULA

Katsuo Hatayama, Ohmiya; Kensei Yoshikawa, Saitama; Tatsuhiko Sano, Ohmiya; Yutaka Ohuchi, Ohimya; Tomomi Ota, Ohimya; Kazuto Sekiuchi, Tokyo, and Kaoru Sota, Tokorozawa, all of Japan, assignors to Taisho Pharmaceutical Co., Ltd., Shizuoka, Japan

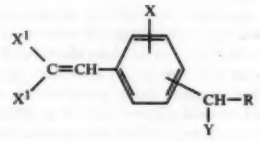
Filed May 14, 1984, Ser. No. 609,858

Claims priority, application Japan, May 19, 1983, 58-87951

Int. Cl.[4] C07F *5/06*; C07C *63/64*

U.S. Cl. 556—183 6 Claims

1. A compound of the general formula



I

wherein X is hydrogen or halogen, X^1 is halogen, R is hydrogen or methyl, Y is hydroxymethyl, carboxyl, —$COOR^1$ or —COR^2 wherein R^1 is prenyl, geranyl, farnesyl, cyclohexyl, phthalidyl, straight or branched chain alkyl having 1 to 6 carbon atoms, or said alkyl substituted with hydroxy, methoxy, pyridyl or alkanoyloxy having 2 to 16 carbon atoms, and R^2 is amino, hydroxyamino, mono-(or di-)alkylamino in which the alkyl moiety contains 1 or 2 carbon atoms, ethoxycarbonylmethylamino, carboxymethylamino, thiazolylamino, cyclohexylamino, pyridylamino, morpholino, N-methylpiperazino, phenylamino, phenylamino substituted with one or two of halogen, hydroxy, methyl, methoxy, trifluoromethyl or carboxyl at the phenyl ring, and the pharmaceutically acceptable salts thereof when Y is carboxyl.

4,557,872

BASIC ALKALINE EARTH METAL SULPHONATES

John F. Marsh; John A. Cleverley, and Dennis J. Simpkin, all of Oxford, England, assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 235,924, Feb. 19, 1981, abandoned, and a continuation-in-part of Ser. No. 102,476, Dec. 11, 1979, abandoned. This application Oct. 11, 1983, Ser. No. 542,504

Claims priority, application United Kingdom, Dec. 13, 1978, 48281/78

Int. Cl.[4] C07B *13/00*

U.S. Cl. 260—504 A 7 Claims

1. A process for the production of oil soluble basic magnesium sulphonates useful as lubricating oil additives comprising carbonating with carbon dioxide a mixture containing

(a) an oil soluble sulphonic acid or a magnesium sulphonate thereof;

(b) excess of magnesium oxide above that required to react with any free sulphonic acid that may be present, said excess being reacted with said carbon dioxide;

(c) a hydrocarbon solvent;

(d) water in an amount of 0.5 to 2 parts by weight based on the total amount of magnesium oxide used;

(e) a C_3 to C_6 monoketone in an amount of 0.5 to 4 parts by weight based on the total amount of magnesium oxide used; and

(f) one or more reaction promoters selected from the group consisting of carboxylic acids or salts thereof, amines, and C_4 to C_6 diketones in an amount of 0.02 to 1.5 parts by weight based on the total amount of magnesium oxide used.

4,557,873

PROCESS FOR ISOLATING PARAFFINSULFONATES AND SULFURIC ACID OF LOW ALKALI METAL SULFATE CONTENT FROM PARAFINSULFOXIDATION REACTION MIXTURES

Rudolf Pistorius, Hünstetten, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 26, 1984, Ser. No. 674,581

Claims priority, application Fed. Rep. of Germany, Nov. 28, 1983, 3342984

Int. Cl.[4] C07C *143/02*

U.S. Cl. 260—513 R 2 Claims

1. A process for isolating paraffinsulfonates and sulfuric acid of low alkali metal sulfate content from paraffinsulfoxidation reaction mixtures with the aid of alcohols, which comprises adding a C_4–C_8-alcohol to the reaction mixture, which has been freed from sulfur dioxide, removing the lower phase of dilute sulfuric acid which separates out, adding to the remaining upper product phase (1) an amount of alkali metal hydroxide such that two phases form and bringing the upper product phase (2) thus obtained to a pH value of 9–12 by addition of some of the product phase (1) and concentrating it by evaporation.

4,557,874

DISTRIBUTION SYSTEM FOR A TWO-PHASE FLUID MIXTURE

Joachim Neumann, Brunswick; Detlef Pickert, and Klaus-Dieter Emmenthal, both of Wolfsburg, all of Fed. Rep. of Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Filed May 23, 1984, Ser. No. 613,101

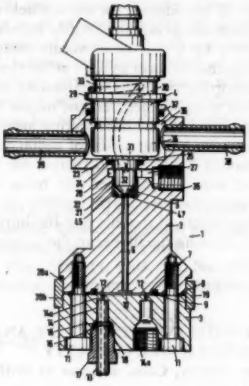
Claims priority, application Fed. Rep. of Germany, Jun. 7, 1983, 3320469

Int. Cl.[4] F02M *55/02*

U.S. Cl. 261—19 10 Claims

1. A distribution system for a two-phase fluid mixture comprising a first housing part having a completely plane, smooth end surface and formed with a single fluid supply line leading to the smooth surface, a second housing part having a com-

pletely plane, smooth end surface positioned in spaced parallel relation to the smooth end surface of the first housing part and formed with a plurality of fluid discharge lines leading from the smooth end surface and disposed symmetrically with respect to the fluid supply line, and spacer means engaging the



smooth end surfaces of the first and second housing parts to hold them in spaced parallel relation to provide a disc-shaped fluid distribution chamber therebetween for distributing fluid from said fluid supply line to said fluid discharge lines, whereby the size of the distribution chamber is determined by the size of the spacer means.

4,557,875

PHASE-CONTACTING PLATE FOR A PHASE-CONTACTING COLUMN

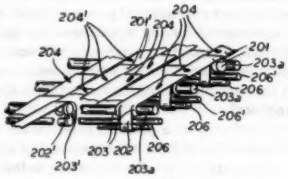
Zoltan Palfi, and Sándor Krekacs, both of Budapest, Hungary, assignors to Orszagos Koolaj es Gazipari Troszt, Budapest, Hungary

Continuation-in-part of Ser. No. 444,577, Nov. 12, 1982. This application Jan. 16, 1985, Ser. No. 691,974

Claims priority, application Hungary, Mar. 16, 1981, 657; PCT Int'l Appl., Mar. 15, 1982, PCT/HU82/00011

Int. Cl.[4] B01F *3/04*

U.S. Cl. 261—75 **11 Claims**



1. In a phase-contacting column in which a low-density phase is passed upwardly into intimate contact with a high-density phase and the column is formed with a multiplicity of phase-contacting plates permitting upward flow of the low-density phase and downward flow of the high-density phase therethrough, the improvement wherein each of said plates is defined by a plurality of pivotable flow-blocking members arranged in alternating rows in which the respective flow-blocking members thereof pivot in opposite direction to the respective blocking members of adjacent rows, the respective blocking members of each row overlapping successive members thereof, each blocking member being deflectable by the upward flow of the low-density phase and controlling the downward flow of the high-density phase, each flow-blocking member comprising:

at least one elongated flow-blocking flat flap pivotable about a transverse axis at one end thereof, and

at least one moment-equalizing element operatively connected with said flow-blocking flap for balancing at least part of the weight thereof about said axis, said flaps together forming a surface of a respective plate supporting said high-density phase.

4,557,876

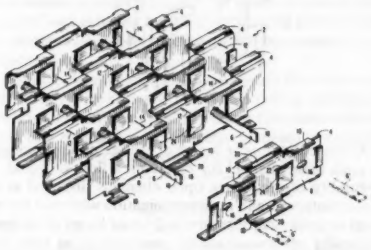
GAS-LIQUID CONTACT APPARATUS AND METHOD OF MAKING IT

Dale E. Nutter, 7935 S. New Haven St., Tulsa, Okla. 74136

Filed Jan. 4, 1984, Ser. No. 568,004

Int. Cl.[4] B01F *3/04*

U.S. Cl. 261—94 **23 Claims**



1. Gas-liquid contact apparatus, comprising, a grid formed of a plurality of spaced apart grid members which are connected together by a plurality of connector members, said grid having surfaces which are wettable by liquid flowing downwardly thereon and having a plurality of vertical passages which permit the flow of ascending gases through the grid,

each of said grid members comprising an elongated upstanding web having upper and lower flanges which extend laterally from the upper and lower portions of the web,

each of said upper flanges being discontinuously formed of a plurality of flange segments which extend alternately in opposite lateral directions from the web,

each of said lower flanges being discontinuously formed of a plurality of flange segments which extend alternately in opposite lateral directions from the web,

each of said flange segments and the flange segments spaced transversely therefrom on the other said grid members extending in a same direction from their respective webs so that said flange segments on adjacent grid members do not extend toward each other to constrict the flow of ascending gases,

said upper flanges having openings which permit liquid to flow through the upper flanges and onto the web, said lower flanges having openings which permit gas to flow through the lower flanges into contact with the liquid on said web.

22. A method of making a gas-liquid contact grid from a plurality of grid members and a plurality of connector members, said grid members having a plurality of flange segments which are discontinuously formed and extend alternately in opposite lateral directions from upper and lower portions of the web, said grid members having holes therein for receiving said connector members, each of said holes being located at a position which, in a direction extending lengthwise of its respective grid member, is between the opposite ends of one of said flange segments, said connector members having slots therein, said method being performed by inserting the connector members through said holes to a position where the slots in the connector members are located in the planes of said grid members and portions of the connector members lie in vertical alignment with said flange segments, turning said connector

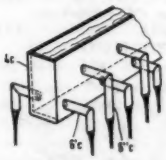
members about their axes to move said connector member slots into engagement with said grid members so that portions of said grid members are received in said slots to hold the grid members together in spaced relationship.

4,557,877

LIQUID DISTRIBUTOR FOR AN EXCHANGE COLUMN

Josef Hofstetter, Wiesendangen, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Dec. 21, 1983, Ser. No. 563,764
Claims priority, application Switzerland, Jan. 4, 1983, 24/83
Int. Cl.[4] B01F *3/04*
U.S. Cl. 261—97 **6 Claims**



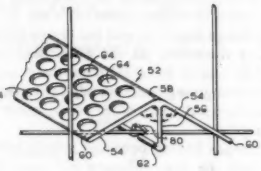
1. A liquid distributor for an exchange column comprising an open main channel for receiving a flow of liquid;
a plurality of secondary open channels disposed at spaced apart intervals and in communication with said main channel to individually receive a flow of liquid therefrom; and
a plurality of flow channels connected to at least some of said secondary channels for removing liquid therefrom laterally and uniformly in the form of downwardly directed liquid streams, said flow channels being disposed in at least two rows one about the other and extending from at least one side of a respective secondary channel.

4,557,878

SPLASH-TYPE FILL

Robert D. Fulkerson, Raytown, Mo., assignor to Munters Corporation, Ft. Myers, Fla.

Filed May 22, 1984, Ser. No. 612,921
Int. Cl.[4] B01F *3/04*
U.S. Cl. 261—111 **10 Claims**



1. A splash bar fill assembly for a splash-type cooling tower, which comprises:
a plurality of splash bars, each splash bar including an elongated member having a pair of upwardly converging leg members joined together to form an apex in the elongate member, and a vertical supporting rib member extending downwardly from the apex of the elongate member; and
means for supporting the splash bars within the cooling tower in an arrangement of successive rows, the splash bars of a respective row of the arrangement being arranged in parallel and in spaced apart relationship, each row having splash bars disposed angularly to those of an adjacent row and situated parallel to and vertically offset from those of an alternate row;
wherein the supporting means includes at least one grid extending transversely of the splash bars, the grid having a plurality of vertical wires for laterally spacing the splash bars and for supporting a tension load, and a plurality of horizontal wires for supporting the splash bars, said vertical wires being spaced apart by a dimension at least sufficient to permit insertion between any two vertical wires of a splash bar, with the vertical supporting rib member thereof supported on a horizontal wire.

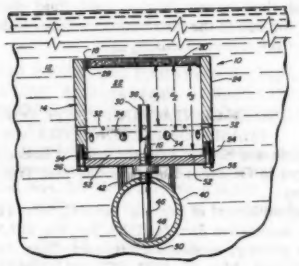
3. A splash-type fill bar adapted for use in a heat exchanging cooling tower, which comprises an elongate member having a cross-section defined by a pair of upwardly converging leg members joined together to form an apex in the elongate member, a vertical supporting rib member extending downwardly from the apex of the elongate member, and means for securing the fill bar to a support wire, the bar securing means including a U-shaped retainer clip having a pair of upstanding resilient arms, each arm having a slot formed therein for receiving a horizontal support wire, the retainer clip being adapted to simultaneously engage the vertical rib member of the fill bar between the arm members of the clip and the horizontal support wire, thereby securing the fill bar to the support wire in a fixed relationship.

4,557,879

GAS DIFFUSER WITH INDEFINITE LIFE AND MIXED BUBBLE SIZE CAPACITY

Richard B. Weber, Denver, Colo., assignor to Wilfley Weber, Inc., Englewood, Colo.

Filed Sep. 24, 1984, Ser. No. 653,842
Int. Cl. B01F *3/04*
U.S. Cl. 261—122 **12 Claims**



1. A gas diffuser for diffusing gas into a body of receiving liquid in which the diffuser is submerged, which comprises a chamber that forms a gas plenum, said chamber including:
(a) a top wall at least a substantial portion of which is formed of a porous material having a stabilized wet permeability of a magnitude to cause the production of fine gas bubbles when gas is introduced under a first predetermined pressure into said gas plenum chamber and exits through said porous top wall;
(b) side walls defining, at a predetermined level below said top wall, a plurality of gas outlet openings of a first predetermined, fixed size to produce coarse gas bubbles when gas is introduced under a second, higher predetermined pressure into said gas plenum chamber and exits through said gas outlet openings, while continuing at all times to exit simultaneously through said porous top wall and through said gas outlet openings in said side walls, said gas outlet openings being unobstructed at all times except for any deposit that may be built up in said openings during use of said diffuser, said unobstructed gas outlet openings in the side walls of said plenum chamber being substantially equally spaced around the perimeter of the chamber; and
(c) a gas inlet opening,
whereby gas introduced under said first predetermined pressure into said gas inlet opening:
will fill the upper portion of said gas plenum and exit

through said porous top wall of the plenum chamber to form a rising central cylindrical column of densely packed fine gas bubbles in the body of receiving liquid in which the diffuser is submerged, and

if the pressure at which the gas is maintained in said plenum is increased to said second predetermined figure, will fill said plenum chamber down to said predetermined level of said plurality of coarse bubble outlet openings and exit through said openings to form a rising outer, hollow, cylindrical sheath of coarse gas bubbles in the body of receiving liquid in which the diffuser is submerged, while said column of fine gas bubbles continues to be discharged through said porous top wall of the plenum chamber.

4,557,880

PIEZOELECTRIC AND PYROELECTRIC FILM

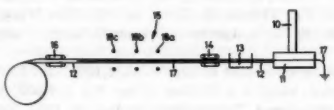
Philippos Pantelis, Ipswich, England, assignor to British Telecommunications, London, England

Filed Mar. 14, 1983, Ser. No. 475,377

Claims priority, application United Kingdom, Mar. 18, 1982, 8207921

Int. Cl.⁴ B29D 7/24

U.S. Cl. 264—22 **33 Claims**



1. A method of extruding and simultaneously treating a PVDF-containing film to enhance its piezoelectric/pyroelectric properties, said method comprising the ongoing simultaneous yet successive steps of:

extruding a tube of polymer containing at least 50 mole % of PVDF;

maintaining a center electrode means within said tube as it is being extruded;

stretching said tube by applying tensile forces therealong, said tensile forces being applied between first and second haul-off means operating at different speeds spaced apart along the downstream path of the tube as it is being extruded; and

applying a poling electrostatic field transversely across the circumferential walls of said tube between an external ring electrode and said center electrode means.

8. Apparatus for extruding and simultaneously treating a PVDF film to enhance its piezoelectric/pyroelectric properties, said apparatus comprising:

extruder means for extruding tube of polymer containing at least 50 mole % of PVDF;

internal electrode means disposed so as to be within said tube as it is being extruded;

first and second spaced apart haul-off means for stretching said tube by applying tensile forces therealong at spaced apart locations along the downstream path of the tube as it is being extruded and moved between said haul-off means; and

external ring electrode means for applying a poling electrostatic field transversely across the walls of said tube between said external ring electrode means and said internal electrode means.

13. A method of extruding and simultaneously treating a PVDF-containing film to enhance its piezoelectric/pyroelectric properties, said method comprising the ongoing simultaneous yet successive steps of:

extruding a polymer film containing at least 50 mole % of PVDF;

maintaining first and second electrode means on opposite sides of said film downstream of said extruding step;

stretching said film by applying tensile forces therealong, said tensile forces being applied between first and second haul-off means operating at different speeds spaced apart along the downstream path of the film as it is being extruded; and

applying a transverse poling electrostatic field across said film between said first and second electrodes as the extruding film passes thereby.

17. Apparatus for extruding and simultaneously treating a PVDF-containing film to enhance its piezoelectric/pyroelectric properties, said apparatus comprising:

extruder means for extruding a polymer film containing at least 50 mole % polyvinylidene fluoride;

first and second electrodes disposed so as to be on opposite sides of said film as it is being extruded at a location downstream of said extruder means;

first and second spaced-apart haul-off means disposed downstream of said extruder means for stretching said extruding film therebetween as it is being moved between said haul-off means; and

electrostatic poling means connected to said first and second electrodes for applying a transverse poling electrostatic field across said film as said extruding film passes thereby;

wherein said first and second electrode means are disposed between said first and second haul-off means.

4,557,881

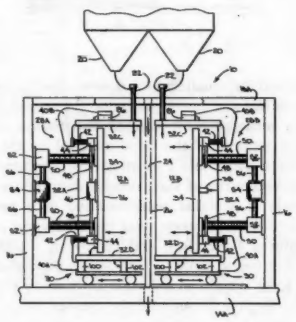
METHOD FOR MANUFACTURING FOAM BOARDS

John Rabotski, Sheboygan, Wis., assignor to Design Engineering Service, Inc., Sheboygan, Wis.

Division of Ser. No. 444,794, Nov. 26, 1982, Pat. No. 4,456,443. This application Apr. 6, 1984, Ser. No. 597,644

Int. Cl.⁴ B29D 27/00

U.S. Cl. 264—40.4 **3 Claims**



1. A method of molding sheets of foamed material, comprising the steps of:

pre-expanding a plurality of expandable thermoplastic polymer beads to a density less than the desired density of the finished sheet;

introducing the pre-expanded beads into a mold cavity having the desired dimensions of the finished sheet;

adjusting the dimensions of the mold cavity to provide a volume which will correspond to the desired density of the finished sheet when filled with pre-expanded beads, said step of adjusting the dimensions of the mold cavity includes the steps of:

sensing the weight of the pre-expanded beads contained within the mold cavity;

computing the additional volume necessary to provide a finished sheet of the desired density; and

moving one side of the mold cavity away from the other side of the cavity to provide the additional volume;

introducing additional pre-expanded beads into the mold cavity to fill the cavity;

heating the beads to further expand the beads into a fusable foamed state;

squeezing the foamed beads while said beads are in a heated fusable state to a predetermined thickness dimension to fuse said beads into an integral foamed mass;

cooling the foamed mass to stabilize the mass and form the finished sheet; and

ejecting the finished sheet from the mold cavity.

4,557,882

METHOD AND APPARATUS FOR EQUALIZING THE DENSITY DISTRIBUTION OF PRESSED WOOD PANELS

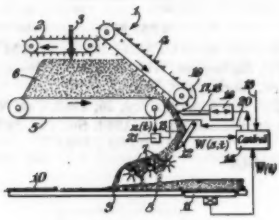
Dieter Arnold, Darmstadt, Fed. Rep. of Germany, assignor to Carl Schenck AG., Fed. Rep. of Germany

Filed Nov. 7, 1983, Ser. No. 549,455

Claims priority, application European Pat. Off., Nov. 20, 1982, 82110741.4

Int. Cl.⁴ B29J *5/04*

U.S. Cl. 264—40.4 **11 Claims**



1. A method for equalizing the density distribution in pressed wood panels manufactured from adhesive coated bulk material comprising measuring the weight distribution over a transverse cross section of the bulk material as the material is flowed from storage onto a forming belt, producing command signals representative of such weight distribution, comparing those signals to a signal representative of a predetermined nominal density distribution over the transverse cross section of the material flow path, and removing weight quantities along the transverse cross section where the command signals indicate excess weight distribution to thereby produce equal density distribution throughout the pressed wood panel.

3. Apparatus for manufacturing pressed wood panels comprising a hopper, a feeder for supplying the hopper with adhesive coated bulk material, the discharge width of the hopper corresponding to the spreading width for the pressed wood panels to be manufactured, devices below the discharge of the bottom belt hopper for downwardly transporting the bulk material in the form of continuous chip mass onto a forming belt, a material guide surface extending the entire spreading width, a weight measuring surface next to the material guide surface for determining the weight of the flowing bulk material at various transverse locations along the spreading width, control means for comparing the weight determined by the measuring surface with a nominal weight value for the particular transverse location being weight measured and thereafter producing a control signal representative of the comparison, and adjustment means at the discharge of the hopper along the entire spreading width for varying the flow of bulk material at the various transverse locations in response to the control signals.

4,557,883

PREPARATION AND EXPANSION OF PERLITE ORE FINES

Jerome C. Shiah, and Mario P. Tocci, both of Littleton, Colo., assignors to Manville Service Corporation, Denver, Colo.

Continuation of Ser. No. 170,424, Jul. 21, 1980, abandoned. This application Feb. 5, 1982, Ser. No. 345,954

Int. Cl.⁴ B29H *7/20*

U.S. Cl. 264—43 **23 Claims**

1. A process for preparing and expanding perlite ore fines which comprises mixing said perlite ore fines with an agglomerating agent which has a viscous liquid phase at a temperature above ambient temperature but below the critical dehydration temperature of said perlite ore fines, said viscous liquid phase being capable of at least partially coating said perlite ore fines, and agglomerating said ore fines by heating the mixture of said perlite ore fines and agglomerating agent to a temperature at which said agglomerating agent exists as said viscous liquid phase, and maintaining said temperature for a period of time sufficient to obtain a viscous agglomeration of said perlite ore fines and said agglomerating agent and feeding said viscous agglomeration into a perlite expander to form said perlite ore fines into expanded perlite of conventional size and density.

4,557,884

REFRACTORY

Daniel R. Petrak, Lynchburg, Va.; Howard M. Winkelbauer, W. Mifflin, Pa.; Thomas R. Kleeb, and Ke-Chin Wang, both of Pittsburgh, Pa., assignors to Dresser Industries, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 321,155, Nov. 13, 1981, abandoned, which is a division of Ser. No. 149,609, May 14, 1980, abandoned. This application Jun. 29, 1984, Ser. No. 626,255

Int. Cl.⁴ C04B *35/02*

U.S. Cl. 264—65 **4 Claims**

1. A method for producing nitride bonded refractory bricks, in situ, comprising mixing, by weight, from about 1 to 25% aluminum, about 1 to 25% substantially pure silica and the balance a refractory brickmaking size graded refractory aggregate, selected from the group consisting of silicon carbide, fused mullite and deadburned magnesite, pressing said mixes into refractory bricks, burning the bricks at a first temperature in a nitriding atmosphere for a time sufficient to form silicon and reactive alumina, said temperature being less than the temperature level at which a sialon intergranular bond will form; further burning the bricks at a temperature exceeding the first temperature in a nitriding atmosphere to form silicon nitride from the previously formed silicon; and forming a sialon intergranular bond for the refractory brick by reacting the previously formed reactive alumina with the silicon nitride.

4,557,885

METHOD OF PRODUCING CAPACITIVE ELECTRONIC DISCS

Helmut G. Kiess, Niedersteinmeur, Fed. Rep. of Germany; Bruno K. Binggeli, Arni, and Max Derendinger, Zurich, both of Switzerland, assignors to RCA Corporation, Princeton, N.J.

Filed Jun. 12, 1984, Ser. No. 619,929

Int. Cl.⁴ B29D *17/00*

U.S. Cl. 264—105 **14 Claims**

1. A method of forming a conductive, high density information disc suitable for capacitive readout which comprises:

(a) providing a homogeneous powder composition comprising a homopolymer or copolymer of vinyl chloride, sufficient finely divided particulate conductive carbon black to provide capacitive readout, stabilizers, processing aids and lubricants compatible therewith, said composition having no particles larger than about 200 micrometers and at least about 70 percent by weight smaller than about 25 micrometers;

(b) coating the powder onto at least one surface of a core disc, said core disc having a viscosity substantially greater than that of the powder composition to substantially prevent diffusion of the powder composition into the core disc during compressing and embossing;
(c) compressing the disc under heat and pressure to fuse the powder coating into a conductive layer; and
(d) embossing an information track therein.

4,557,886

METHOD OF PRODUCING CAPACITIVE ELECTRONIC DISCS

Helmut G. Kiess, Niedersteinmaur, Fed. Rep. of Germany; Bruno K. Binggeli, Arni, and Max Derendinger, Zurich, both of Switzerland, assignors to RCA Corporation, Princeton, N.J.

Filed Jun. 12, 1984, Ser. No. 619,985
Int. Cl.[4] B29D *17/00*
U.S. Cl. 264—105 **10 Claims**

1. A method of forming a conductive, high density information disc suitable for capacitive readout which comprises:
(a) providing in a suitable molding apparatus a homogeneous powder composition and having a particle size of 400 micrometers or less and comprising a homopolymer or copolymer of vinyl chloride, sufficient conductive carbon black to provide capacitive readout, stabilizers, processing aids and lubricants compatible therewith;
(b) directly compressing the powder composition in said apparatus under heat and pressure to form a conductive disc having a thickness of from about 0.15 to 0.6 mm; and
(c) embossing an information track in at least one surface thereof.

4,557,887

METHOD FOR PRODUCING THIN SILICONE ELASTOMERIC FILMS

Isao Ona; Masaru Ozaki, and Katsutoshi Usui, all of Chiba, Japan, assignors to Toray Silicone Company, Ltd., Tokyo, Japan

Filed Jun. 15, 1983, Ser. No. 504,646
Claims priority, application Japan, Jun. 16, 1982, 57-103426
Int. Cl.[4] B29D *7/02*
U.S. Cl. 264—216 **5 Claims**

1. A method for producing a thin silicone elastomeric film comprising coating an addition-curable or dehydrocondensation-curable fluid silicone elastomer composition on a coated paper which has a peeling resistance of the cured silicone elastomer from the coated paper surface of no more than 50 g/cm at 25° C. at a peeling rate of 30 cm/min and a peeling angel of 180°, curing the resulting coating of silicone elastomer composition which is on the coated paper, and thereafter peeling the resulting thin silicone elastomeric film from the coated paper to obtain a 1 to 500μ thick silicone elastomeric film.

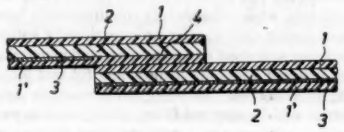
4,557,888

METHOD FOR THE MANUFACTURE OF PACKING CONTAINERS AND AN ARRANGEMENT FOR THE REALIZATION OF THE METHOD

Anders R. Rausing, Lausanne, and Erling I. Nilsson, ÅKarp, both of Switzerland, assignors to Tetra Pak Developpement SA, Switzerland

PCT No. PCT/SE83/00009, § 371 Date Sep. 9, 1983, § 102(e) Date Sep. 9, 1983, PCT Pub. No. WO83/02423, PCT Pub. Date Jul. 21, 1983
PCT Filed Jan. 19, 1983, Ser. No. 541,321
Claims priority, application Sweden, Jan. 20, 1982, 82.00286
Int. Cl.[4] B29C *1/12*
U.S. Cl. 264—230 **9 Claims**

1. A method of manufacturing a container from a laminated web having a base layer of orientation-stretched polyester, a layer of metal foil, and at least one surface layer of glycol-modified polyester adjacent said base layer, said metal foil providing a gas barrier, said method comprising the steps of:
providing a recess in said layer of metal foil along a first edge region of said web;
forming said web into a tubular element with said first edge



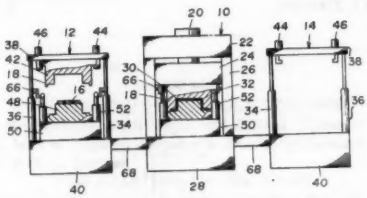
region and another edge region of said web overlapping such that said layer of metal foil of said other edge region is separated from said first edge region by said base and surface layers of said other edge region;
bonding said overlapped first and other edge regions; and
plastically deforming said tubular element.

4,557,889

METHOD AND APPARATUS FOR PRODUCING SHEET MOLDING COMPOUND PARTS BY COMPRESSION

Shigeru Masuda, and Tsuneaki Yashima, both of Takasago, Japan, assignors to Kawasaki Yucoh Co., Ltd., Hyogo, Japan

Continuation of Ser. No. 416,556, Sep. 10, 1982, abandoned, and Ser. No. 416,488, Sep. 10, 1982, abandoned. This application Aug. 9, 1984, Ser. No. 639,184
Claims priority, application Japan, Sep. 26, 1981, 56-152649; Sep. 26, 1981, 56-152648
Int. Cl.[4] B29D *27/00*
U.S. Cl. 264—320 **9 Claims**



1. A method for producing a sheet molding compound part from a sheet molding compound material which comprises:
providing a main high compression press means including a movable platen capable of developing a force required for compressing into a predetermined shape and curing said sheet molding compound material by delivering a short, high compression stroke to said sheet molding compound material;
providing at least one auxiliary low compression press means including a mold form for molding said sheet molding compound material comprising an upper mold half and a lower mold half, said at least one auxiliary low compression press means being interconnected with and juxtapositioned to said main press means;
providing vertically aligned adjustable precision levelling devices for continuously maintaining said upper mold half parallel with said lower mold half throughout said molding operation;
charging said sheet molding compound material to said lower mold half of said mold form in said at least one auxiliary press means;
closing said mold form by lowering said upper mold half to said lower mold half to form a mold cavity so as to initially shape said sheet molding compound material such

that said material flows and fills said mold cavity, said upper mold half being supported by said levelling devices;

transferring said mold form containing said sheet molding compound material to said main high compression press means by way of said interconnection together with said levelling devices, said levelling devices continuously maintaining said upper mold half parallel with said lower mold half, while substantially simultaneously heating said mold during said transfer process thereby softening and fluidizing said sheet molding compound material such that said material continues to flow and fill said mold cavity, said levelling devices being synchronously adapted to control said flowing and filling of said mold in response to precise positioning by a predetermined programmed control according to a gelled state of said sheet molding material such that said sheet molding material evenly and uniformly fills said mold cavity;

compressing and curing said sheet molding compound material into said predetermined shape within said high compression press means;

transferring said mold from said main press means to said at least one auxiliary press means together with said levelling devices, and

removing said sheet molded compound part.

4,557,890

SPRAY DEVICES FOR NUCLEAR REACTOR CORES

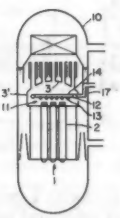
Waka Matsuda, Yokohama, and Tatsuo Kagawa, Tokyo, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Filed Nov. 30, 1982, Ser. No. 445,762

Claims priority, application Japan, Dec. 10, 1981, 56-199156

Int. Cl.[4] G21C *15/18*

U.S. Cl. 376—282 **5 Claims**



1. A nuclear reactor system comprising:

a reactor pressure vessel;

a reactor core contained in said reactor pressure vessel and surrounded by a shroud and a shroud head mounted on said shroud;

a fuel rod assembly disposed in said reactor core so as to define a space between a top end of said fuel rod assembly and said shroud head; and

a spray device supported to said shroud and located in said space for spraying cooling water to said fuel rod assembly; said spray device comprising duct means disposed along the inner periphery of said shroud, a plurality of spargers pivotably connected to said duct means and extending therefrom toward a central axis of said reactor core when said spargers assume a substantially horizontal position, said spargers being rotatable upwardly by more than 90° from said horizontal position, a plurality of nozzles provided for said respective spargers for downwardly ejecting cooling water to said fuel rod assembly, and means for unitarily securing said spargers when they are horizontally positioned.

4,557,891

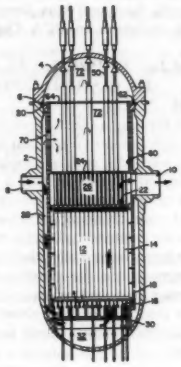
PRESSURIZED WATER REACTOR FLOW ARRANGEMENT

John F. Gibbons, Windsor, and Richard W. Knapp, West Simsbury, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Continuation of Ser. No. 773,465, Mar. 2, 1977, abandoned. This application Apr. 26, 1982, Ser. No. 371,882

Int. Cl.[4] G21C *15/00*

U.S. Cl. 376—397 **2 Claims**



1. A pressurized water nuclear reactor comprising:

a reactor vessel body having an inlet opening and an outlet opening;

a reactor vessel head secured to the top of said reactor vessel body;

upper and lower core end plates;

a core supported within said reactor vessel body between said upper and lower end plates;

vertically movable control rods passing through said core;

guide tubes surrounding said control rods and vertically extending through said core;

a seal plate structure spaced above said upper end plate defining therebetween an outlet chamber above said core;

a pressurized chamber located above said outlet chamber, the control rod guide tubes passing vertically through said outlet chamber into said pressurized chamber;

a core support barrel surrounding said core and forming the outer periphery of the outlet chamber, said barrel supporting said core and thereby forming an inlet chamber there below, said core support barrel also supported within said reactor vessel body thereby forming an annular space therebetween, the annular space and the inlet chamber being in fluid communication;

an opening through said core support barrel near the upper end thereof, said annular space, said opening, and said pressurized chamber being in fluid communication with said inlet opening for passage of water therebetween;

a first main water flow path from said inlet opening downwardly around the periphery of said core to the lower portion of said core;

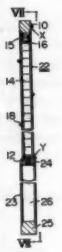
a parallel water flow path from said inlet opening through said pressurized chamber and thence continuing through said guide tubes to the lower portion of said core; and

a combined water flow path upwardly from the lower portion of the core through said core.

4,557,892
NUCLEAR FUEL ELEMENT

Sei-ichi Komoda, Hitachi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 18, 1983, Ser. No. 467,801
Claims priority, application Japan, Feb. 19, 1982, 57-24490
Int. Cl.⁴ G21C *3/18, 3/32*
U.S. Cl. 376—412 7 Claims



1. A nuclear fuel assembly having a tubular body accommodating a multiplicity of nuclear fuel elements, each nuclear fuel element comprising a clad tube including a first clad tube portion and a second clad tube portion, an intermediate plug to which an end of each of said first and second clad tube portions is attached, said intermediate plug having passage means therethrough for enabling fluid communication between said first and second clad tube portions, end plugs respectively attached to the other ends of said first and second clad tube portions, a plurality of fuel pellets being charged in said first clad tube portion, a gas plenum formed in said second clad tube portion, and a wire spacer wound round only said first clad tube portion charged with said fuel pellets, said wire spacer having opposite ends thereof respectively fixed to said intermediate plug and said end plug attached to the other end of said first clad tube portion, said second clad tube portion having an inside diameter greater than the inside diameter of said first clad tube portion.

4,557,893
PROCESS FOR PRODUCING COMPOSITE MATERIAL BY MILLING THE METAL TO 50% SATURATION HARDNESS THEN CO-MILLING WITH THE HARD PHASE

Arun D. Jatkar, Monroe; Alfred J. Varall, Jr., Middletown, and Robert D. Schelleng, Suffern, all of N.Y., assignors to INCO Selective Surfaces, Inc., Wyckoff, N.J.

Filed Jun. 24, 1983, Ser. No. 507,837
Int. Cl.⁴ B22F *1/00*
U.S. Cl. 419—12 5 Claims

1. A process for producing a composite product comprising a metallic matrix selected from the group of aluminum and aluminum-base alloys and particles of a hard reinforcing phase, to provide in the composite product at least one mechanical characteristic reflective of matrix metal properties and one mechanical characteristic reflective of said hard reinforcing phase properties comprising mechanically alloying particles of said aluminum or aluminum-base alloy in the absence of said hard reinforcing phase particles to at least about 50% of saturation hardness and thereafter mechanically milling the thus mechanically alloyed metal particles with particles of said hard reinforcing phase to provide a powder wherein said hard reinforcing phase particles comprise about 0.2% to about 30% by volume of said powder and wherein said reinforcing phase particles are enveloped in and bonded to said metallic matrix and thereafter pressing and heat processing said powder, alone or in admixture with other metal powder, to provide a mechanically formable, substantially void-free mass, said heat processing being conducted at a temperature appropriate to said metal matrix and at which said metal matrix is substantially entirely in the solid state.

4,557,894
FRICTION-ACTUATED EXTRUSION

Alan J. Bangay, New Malden; Adrian Cole, Maidenhead, and John S. Vernon, Ealing, all of England, assignors to BICC Public Ltd., Co., London, England

Continuation of Ser. No. 551,936, Nov. 15, 1983, abandoned.
This application Feb. 28, 1985, Ser. No. 706,525
Claims priority, application United Kingdom, Nov. 25, 1982, 8233615; Jan. 10, 1983, 8300536
Int. Cl.⁴ B22F *3/02*
U.S. Cl. 419—67 9 Claims

1. A process of friction-actuated extrusion of copper comprising pickling cathode copper, granulating the pickled copper, and feeding the pickled, granulated copper into a continuous friction-actuated extrusion apparatus.

4,557,895
YELLOW GOLD ALLOY

Robert J. Karamon, and Robert T. Allen, both of Indianapolis, Ind., assignors to Herff Jones, Inc., Indianapolis, Ind.

Filed Dec. 10, 1984, Ser. No. 679,668
Int. Cl.⁴ C22C *30/02, 5/08*
U.S. Cl. 420—587 5 Claims

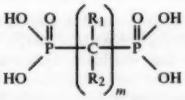
1. A yellow gold alloy consisting essentially of 11% to 16% by weight gold, 28% to 34% by weight silver, 30% to 38% by weight copper, 8% to 12% by weight palladium, 7% to 10% by weight zinc, 0.2% to 0.4% by weight silicon, and about 0.02% by weight boron.

4,557,896
TREATMENT OF AQUEOUS SYSTEMS

Philip Brocklebank, Warrington, and John J. Bennison, Runcorn, both of England, assignors to Dearborn Chemicals Limited, Widnes, England

Filed Jun. 9, 1981, Ser. No. 271,872
Claims priority, application United Kingdom, Sep. 25, 1980, 8030967
Int. Cl.⁴ C23F *11/00, 11/08, 11/10*
U.S. Cl. 422—14 8 Claims

1. Method of inhibiting corrosion in aqueous cooling systems comprising adding thereto as the sole corrosion inhibiting ingredient a mixture consisting of a water soluble inorganic nitrite and a phosphonate of the formula



(I)

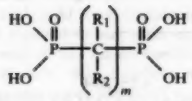
wherein m is an integer from 1 to 10, R_1 is hydrogen or alkyl of 1 to 4 carbon atoms and R_2 is hydroxyl, hydrogen or alkyl of 1 to 4 carbon atoms, said nitrite being present in an amount of 10–35 ppm and said phosphonate being present in an amount of 0.1 to 20 ppm.

5. Method of inhibiting corrosion in aqueous cooling systems comprising adding thereto as the sole corrosion inhibiting ingredient a mixture consisting of

a water soluble inorganic nitrite,

a phosphonate of the formula

(I)



wherein m is an integer from 1 to 10, R_1 is hydrogen or alkyl of 1 to 4 carbon atoms and R_2 is hydroxyl, hydrogen or alkyl of 1 to 4 carbon atoms, and

a polymer having a molecular weight of 500–100,000 and possessing recurring units of the general formula:

wherein R_1 represents hydrogen or alkyl of 1 to 4 carbon atoms, X represents COOH, and Z represents hydrogen or COOH; or X and Z together represent —CO—O—CO—, said nitrite being present in an amount of 10–35 ppm, said phosphonate being present in an amount of 0.1 to 20 ppm, and said polymer being present in an amount of 0.5 to 50 ppm.

4,557,897

METHOD FOR SUPPLYING COLD OR HOT WATER

Hiroshi Kunieda, Nishinomiya; Hiroshi Yamamoto, Amagasaki; Yuji Nishkawa, Amagasaki, and Yoshihiko Enpuku, Amagasaki, all of Japan, assignors to The Furukawa Electric Co., Ltd., Tokyo, Japan

Filed Mar. 2, 1984, Ser. No. 585,473
Int. Cl.[4] C23F *11/00*
U.S. Cl. 422—15 **4 Claims**

1. A method of conditioning hot or cold water delivered through a copper pipe or tubing system comprising the addition of phytic acid or its water soluble salts to the hot or cold water flowing through said copper pipe or tubing system.

4,557,898

METHOD OF DISINFECTING AND STERILIZING WITH HYDROGEN PEROXIDE COMPOSITIONS

Donald F. Greene, Middletown, and Virginia L. Urban, Midland Park, both of N.J., assignors to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 95,947, Nov. 20, 1979, Pat. No. 4,518,585, which is a continuation-in-part of Ser. No. 902,006, May 1, 1978, abandoned. This application Feb. 22, 1985, Ser. No. 704,431
Claims priority, application Canada, May 1, 1979, 326734
Int. Cl.[4] A01N *31/00, 31/14, 59/00;* A61L *2/16*
U.S. Cl. 422—28 **12 Claims**

1. A method for disinfecting and sterilizing a surface which comprises treating the surface with an effective amount of an aqueous disinfecting and sterilizing composition consisting essentially of by weight of the composition:

(a) from about 0.5 to about 50 percent of hydrogen peroxide,

(b) from about 0.1 to about 30 percent of a surfactant which is compatible with hydrogen peroxide,

(c) from about 0.1 to about 3 percent of an organic or inorganic acid,

(d) from 0 to about 1 percent of an organic triazole corrosion inhibitor,

(e) from about 0.01 to about 1 percent of an aqueous-alcoholic mixture of a tertiary amine and a fatty acid alkanolamide and

(f) the balance water;

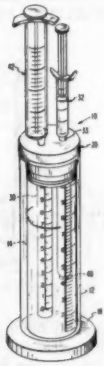
said composition having a pH below about 5.

4,557,899

WATER-IN-OIL TESTING APPARATUS

David J. Schoonover, and Tillman F. Taylor, Jr., both of Loveland, Colo., assignors to Hach Company, Loveland, Colo.

Filed Oct. 15, 1984, Ser. No. 660,784
Int. Cl.[4] G01N *33/18, 33/22*
U.S. Cl. 422—55 **17 Claims**



1. Apparatus for determining the water content of a petroleum product comprising:

(a) an outer upright tubular member;

(b) an inner upright tubular member having an outside diameter smaller than the inside diameter of said outer tubular member such that a cavity is defined between said inner and outer tubular members;

(c) sealing means forming a seal between the lower ends of said inner and outer tubular members;

(d) a cap member which encloses the top end of each of said inner and outer tubular members;

(e) a lift tube disposed in said inner tubular member, wherein said lift tube includes an opening in its lower portion, and wherein the upper portion of said lift tube communicates with said cavity;

(f) a reaction vial containing a sample of said petroleum product to be tested and a reactant which produces a gas upon reaction with water; wherein said vial is disposed within said inner tubular member;

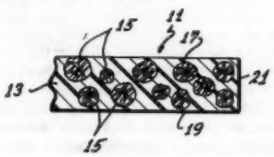
(g) means for introducing said sample of said petroleum product into said vial.

4,557,900

OPTICAL SENSOR WITH BEADS

Harold A. Heitzmann, Costa Mesa, Calif., assignor to Cardiovascular Devices, Inc., Irvine, Calif.

Filed Sep. 28, 1982, Ser. No. 425,420
Int. Cl.[4] G01N *21/77, 21/78, 33/52*
U.S. Cl. 422—55 **21 Claims**



1. An optical sensor comprising:

a matrix of hydrophobic material, said matrix being permeable to at least a selected gas in a liquid and substantially impermeable to the liquid;

a plurality of particles of hydrophilic material dispersed in said matrix, at least some of said particles carrying an optical indicator in solution which is capable of responding to said selected gas; and

said matrix being capable of transmitting light at least at selected wavelengths from outside said matrix to said particle, and said matrix isolating the particles from the liquid so that the optical indicator can respond to said light and provide an optical signal related to partial pressure of said selected gas.

4,557,901

ANALYTICAL ELEMENT

Mikio Koyama; Kenichiro Okaniwa; Masakuni Saruhashi, and Yuko Ohmachi, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Oct. 29, 1982, Ser. No. 437,691

Claims priority, application Japan, Nov. 4, 1981, 56-177596

Int. Cl.⁴ G01N *33/52, 21/78*

U.S. Cl. 422—56 **13 Claims**

1. An analytical element for use in qualitatively and quantitatively analyzing the presence of a component in an aqueous fluid comprising:

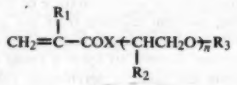
(a) a light-transmissive support;

(b) a reagent layer comprising at least one layer positioned on one side of said support, said reagent layer comprising:

(1) at least one reagent reactive with said component to be analyzed;

(2) a hydrophilic colloid; and

(3) a substantially water-dispersible copolymer obtained by the copolymerization of at least one copolymerizable monomer, said at least one copolymerizable monomer being water-soluble and having a non-ionizable group in the side chain thereof, and being represented by formula (I):



(I)

wherein R_1 and R_2 may be the same or different, and each represent a hydrogen atom or a methyl group; R_3 is a hydrogen atom or a mono-valent organic residue; X is an oxygen atom or a di-valent organic group represented by the formula

where R_4 is a hydrogen atom, an alkyl group or a group represented by the formula: $-CHCH_2O)_mR_3$, where m is an integer of 2 to 100;

and n is an integer of 2 to 100, with at least one copolymerizable hydrophobic monomer; and

(c) a porous spreading layer comprising at least one layer positioned on said reagent layer on the side opposite to that of said support.

4,557,902

TESTING TUBE AND TESTING TUBE FILTER ASSEMBLY THEREFOR

Bernd Mussmann, Lübeck, Fed. Rep. of Germany, assignor to Drägerwerk A.G., Fed. Rep. of Germany

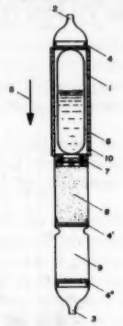
Filed May 7, 1982, Ser. No. 376,186

Claims priority, application Fed. Rep. of Germany, May 13, 1981, 3118878

Int. Cl.⁴ B01D *46/10;* **G01N** *21/78*

U.S. Cl. 422—59 **7 Claims**

5. A filter element for use in a testing tube comprising a tubular ring member insertable in the testing tube having an outwardly flaring end adjacent one end which is tightly engageable with the walls of said tube, said ring member having a through bore therethrough with a filter support ledge defined in said bore and a groove defined in said bore overlying the ledge, a filter disc insertable through the outwardly flaring end



and engageable on said ledge, and cover means overlying said filter disc and having a rim bead engaged in said groove, said cover means being adapted to hold said filter disc in position in said ring member and including means for gas passage.

4,557,903

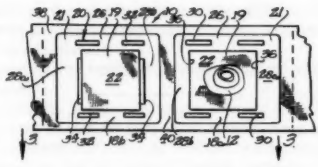
APPARATUS FOR PREPARING AND EMBEDDING TISSUE SAMPLES FOR HISTOLOGICAL EXAMINATION

James B. McCormick, Chicago, Ill., assignor to Pelam, Inc., Chicago, Ill.

Filed Sep. 16, 1983, Ser. No. 533,148

Int. Cl.⁴ B01L *11/00*

U.S. Cl. 422—101 **6 Claims**



1. A capsule for receiving and retaining a tissue specimen during fluid treatment preparatory to histological examination comprising

a pair of frames, each of said frames defining a central opening, said frames having complementary faces adapted to abut one another in face-to-face registered relationship, the openings within said abutting frames defining a fluid passageway for tissue treating fluids,

a porous web spanning the central opening of each of said frames, said webs being spaced apart when said frames are in abutting relationship defining therebetween a tissue receiving cavity, said web having a porosity that retains all portions of a tissue specimen placed in said cavity while permitting fluid flow therethrough, said web being easily cuttable to permit submerging of said web in embedding medium when said capsule is used as the base for an embedded tissue block, and

means for maintaining said frames in abutting relationship.

4,557,904

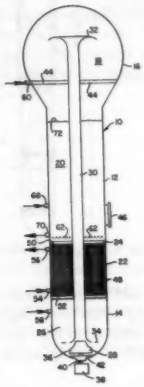
INTEGRAL REACTOR APPARATUS

William B. Brod; George H. Coppala, and Delbert L. Olds, all of St. Albans, W. Va., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Mar. 26, 1984, Ser. No. 593,045

Int. Cl.[4] F27B *15/16*

U.S. Cl. 422—146 10 Claims



1. Integral apparatus for fluidized bed reaction systems comprising: a reactor having a disentrainment zone near one end thereof, a compression-diffuser zone near the other end thereof and a fluidized bed reaction zone therebetween; suction recycle fluid conduit means fixedly supported within said reactor extending along the entire length through an interior portion of said fluidized bed and provided for the inlet flow of recycle fluid at one end thereof positioned in said disentrainment zone and discharge flow of recycle fluid at the other end thereof positioned in said compression-diffuser zone; and cooler and gas distributor means positioned in said reactor near the lower end thereof, said cooler means being in thermal contact with said discharge recycle fluid.

4,557,905

LEACHING AND WASHING A FLOCCULATED SLURRY HAVING A FIBER CONTENT

Michael I. Sherman; Carl L. Elmore, both of Glens Falls, N.Y., and Robert J. Brison, Golden, Colo., assignors to Kamyr, Inc., Glens Falls, N.Y.

Division of Ser. No. 503,178, Jun. 10, 1983, Pat. No. 4,501,721.

This application Sep. 13, 1984, Ser. No. 649,921

The portion of the term of this patent subsequent to Feb. 26, 2002, has been disclaimed.

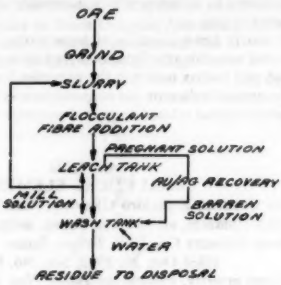
Int. Cl.[4] C01G *7/00*

U.S. Cl. 423—27 21 Claims

1. A method of treating particlized metal bearing ore to effect removal of the metal therefrom, comprising the steps of:

(a) forming a slurry from the particlized ore, liquid, a flocculating agent, and fibers, the flocculating agent and fibers causing the particlized mineral material to be locked in a stable network;

(b) subjecting the slurry to treatment with a leaching liquid; and



(c) removing the metal from the leaching liquid after treatment of the slurry.

4,557,906

RECOVERY OF RHENIUM

Alan D. Douglas; Kenneth T. Reilly, both of Towanda, and John E. Landmesser, Monroeton, all of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Nov. 7, 1984, Ser. No. 669,125

Int. Cl.[4] C01G *47/00, 41/00*

U.S. Cl. 423—49 1 Claim

1. A process for recovering rhenium and tungsten values from a rhenium bearing material consisting of about 1 to about 10 percent by weight rhenium metal with a balance consisting essentially of tungsten metal, said process comprising: (a) reacting said rhenium bearing material with a mixture of sodium hydroxide and an oxidizing reactant selected from the group consisting of sodium nitrate, sodium nitrite, sodium chlorate, sodium peroxide and mixtures thereof to form a fused solid comprising sodium tungstate and sodium perrhenate, (b) dissolving said fused solid in the water under conditions suitable to form a solution having a pH of from about 10 to about 14 comprising sodium tungstate in an amount from about 50 to about 150 grams per liter based on the weight of tungsten and sodium perrhenate in an amount from about 0.5 to about 15 grams per liter based on the weight of rhenium, contacting said solution with a bed of a strongly basic anion exchange resin to absorb the major portion of the rhenium values and form a rhenium depleted solution comprising substantially all of the tungsten values, (c) stripping the rhenium values from said resin with a nitric acid solution.

4,557,907

HYDROTHERMAL DISINTEGRATION OF CALCINED ALUMINUM OXIDE WASTES

Peter Christophliemk, Düsseldorf; Jürgen von Laufenberg, Haan; Rudolf Novotny, Düsseldorf; Siegfried Staller, Ratingen, and Friedrich W. Diekötter, Langenfeld, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Düsseldorf, Fed. Rep. of Germany

Filed May 27, 1983, Ser. No. 499,038

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1982, 3224040

Int. Cl.[4] C01F *7/06*

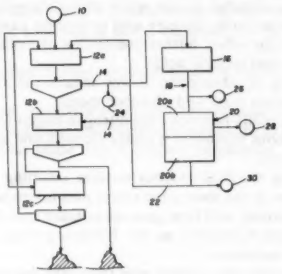
U.S. Cl. 423—119 17 Claims

1. A process for hydrothermally disintegrating wastes or residues having a high content of α-Al_2O_3 to sodium aluminate comprising reacting said wastes or residues with an aqueous sodium hydroxide solution having a concentration of sodium hydroxide of from about 20 to about 50% by weight at a temperature in the range of from about 180° C. to about 250° C. under a saturated steam pressure corresponding to said temperature.

4,557,908
PROCESS FOR THE TREATMENT OF A PURGE SOLUTION PARTICULARLY INTENDED FOR A PROCESS FOR THE EXTRACTION OF ZINC BY ELECTROLYSIS

Michel Laveyne, Trappes, and Claude Palvadeau, Breuillet, both of France, assignors to Minemet Recherche, Trappes, France and Preussag-Weser-Zink GmbH, Nordenham, Fed. Rep. of Germany

Filed Apr. 24, 1984, Ser. No. 603,267
Claims priority, application France, Apr. 25, 1983, 83 06805
Int. Cl.⁴ C25C *1/16*
U.S. Cl. 423—164 **15 Claims**



1. A method of producing a purge solution during the electrolytic recovery of metal from an aqueous solution containing a high concentration of a recoverable metal salt, said process comprising the steps of:

feeding a catholyte comprising said aqueous solution containing the recoverable metal salt to a cathode compartment of an electrolysis cell, said cathode compartment containing a cathode;

feeding an anolyte comprising said aqueous solution containing the recoverable metal salt to an anode compartment of said electrolysis cell, said anode compartment containing an anode, said cathode compartment and said anode compartment being separated by an anion exchange membrane;

causing said recoverable metal to be deposited on the cathode of said electrolysis cell by electrolysis;

causing said anions to migrate from said catholyte through said anion exchange membrane to said anolyte by electrodialysis; and

adjusting the flow rate of said anolyte through the anode compartment in such a manner that the acid concentration in said anolyte remains below 0.5N to increase the efficiency of said anion exchange membrane.

4,557,909
METHOD TO IMPROVE ACIDULATION QUALITY OF NORTH CAROLINA PHOSPHATE ROCK

Alexander D. Mair, Florence, Ala., assignor to Tennessee Valley Authority, Muscle Shoals, Ala.

Continuation of Ser. No. 649,034, Sep. 10, 1984, abandoned. This application Dec. 13, 1984, Ser. No. 681,157
Int. Cl.⁴ C01B *25/16*
U.S. Cl. 423—167 **3 Claims**

1. An improved process for single-stage calcining organic matter contaminated phosphatic apatite rock of the mineral class generally known as francolites and of the subclass generally known as unaltered francolites, said unaltered francolites characterized by retaining a high degree of substitution in the crystal lattice thereof of materials selected from the group comprising ions of carbonate, sodium, sulfate, and mixtures thereof, said improved process consisting of:

(1) thermally treating said rock within the temperature range of about 790° C. to about 820° C. for a period of time ranging from about 30 to about 90 minutes,

(2) subsequently removing at least a substantial portion of the species in said rock effected water-soluble by said thermal treatment in (1) supra, including sodium and sulfate ions and traces of residual sulfides by leaching same, for a predetermined time sufficient to effect said removal, with aqueous media, said aqueous media selected from the group consisting of substantially pure water, salt solutions, seawater, gypsum pond water derived from wet-process phosphoric acid manufacture, and mixtures thereof, and

(3) recovering as product from the process the resulting calcined and leached intermediate product in a form eminently suitable for the subsequent acidulation thereof to phosphoric acid,

said process characterized by the fact that said calcining of said organic matter contaminated phosphatic apatite rock is effected in such a manner so as to produce therefrom a resulting calcined phosphate rock product having substantially all of the congeneric organic matter eliminated therefrom, having acid evolved sulfide formation therefrom substantially minimized, having decomposition of said francolite mineral to a less highly substituted fluorapatite substantially minimized with substantial amounts of the associated carbonate which is originally structurally incorporated within the crystal lattice of said francolite mineral being retained therein, and effecting in said leaching treatment in step (2) supra subsequent to the calcining in step (1) supra a substantial enhancement of the porosity thereof to thereby effect a surface area of at least 2 m^2/g.

4,557,910
PRODUCTION OF SODA ASH FROM NAHCOLITE

Morton Meadow, Trenton, N.J., assignor to Intermountain Research & Development Corporation, Green River, Wyo.

Filed Mar. 29, 1982, Ser. No. 362,826
Int. Cl.⁴ C01D *15/08, 7/37, 17/00*; C22B *26/10*
U.S. Cl. 423—206 T **13 Claims**

1. A method for preparing soda ash from nahcolite ore, which comprises

(a) partially calcining dry-mined, crushed nahcolite ore to convert at least half, but not all, of its bicarbonate content to carbonate;

(b) dissolving the soluble portion of the calcine in an aqueous solution to form a carbonate-containing solution admixed with ore insolubles;

(c) separating the resultant aqueous solution from the ore insolubles;

(d) crystallizing sodium carbonate, selected from the group consisting of sodium carbonate monohydrate and anhydrous sodium carbonate, at elevated temperature; and

(e) recovering the crystallized sodium carbonate from the crystallization slurry.

4,557,911
PROCESS FOR PRODUCING SWEET CO_2 AND HYDROCARBON STREAMS

Clifton S. Goddin, Jr., and Boyd E. Cabanaw, both of Tulsa, Okla., assignors to Amoco Corporation, Chicago, Ill.

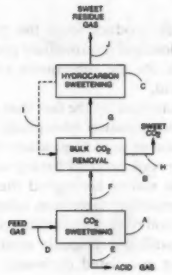
Filed Jun. 28, 1984, Ser. No. 625,490
Int. Cl.⁴ C01B *17/16, 31/20*
U.S. Cl. 423—228 **11 Claims**

1. Process for the removal of hydrogen sulfide and carbon dioxide from a gaseous feedstream comprising hydrocarbons comprising:

introducing the gaseous feedstream into a CO_2 sweetening absorption zone and contacting the gaseous feedstream with a first lean amine solution stream under conditions selective for the removal of hydrogen sulfide relative to carbon dioxide and absorbing at least a major portion of the hydrogen sulfide from the gaseous feedstream produc-

ing a first gaseous product stream and a first rich amine stream containing absorbed hydrogen sulfide;

introducing the first gaseous product stream into a bulk CO_2 removal absorption zone and contacting the first gaseous product stream with a second lean (or semilean) amine solution stream under conditions effective for absorbing and removing a major portion of carbon dioxide from the first gaseous product stream and producing a second gaseous product stream and a second rich amine stream containing absorbed carbon dioxide; and



introducing the second gaseous product stream into a hydrocarbon sweetening absorption zone and contacting the second gaseous product stream with a third lean amine solution stream under conditions effective for removal of a major portion of all remaining carbon dioxide and hydrogen sulfide and producing a fourth gaseous product stream comprising hydrocarbons and a third rich amine stream, wherein

the first lean amine solution, the second lean (or semilean) amine solution, and the third lean amine solution each comprises an amine selected from the group consisting of tertiary amines and sterically hindered amines.

4,557,912

AIR POLLUTION REDUCTION

Milton J. Maguire, 3745 W. El Caminito Dr., Phoenix, Ariz. 85021

Filed Nov. 14, 1984, Ser. No. 673,193
Int. Cl.[4] C01B *17/00, 17/82;* **B01D** *19/00*
U.S. Cl. 423—242 **7 Claims**

1. The method of reducing air pollution by treating air-polluting waste industrial flue gases containing sulfur dioxide in a manner effective to substantially reduce the content of sulfur dioxide therein and remove it in the form of a sulfuric acid by-product prior to discharge of the treated flue gases into the atmosphere, comprising

conduiting the waste industrial flue gases through means for removing solid particulate matter therefrom, separating said waste industrial flue gases into a low molecular weight fraction and a higher molecular weight portion, said separating step including conduiting the flue gases through a duct which turns sharply in direction to thereby effect a centrifugal throwing of the highest molecular weight molecules of the flue gas toward the outer side of the duct where they are swept out a separate duct for conduiting the same as said higher molecular weight portion to reactor tower means

conduiting at least said higher molecular weight portion of said flue gases to said reactor tower means, said higher molecular weight portion being that portion having a greater concentration of sulfur dioxide than in said waste industrial flue gas,

moving said portion upwardly through said reactor tower means while intimately intermingling said portion with a sufficient quantity of air oxygen and a sufficient quantity of a variety of nitrogen oxides for effecting oxidation of the sulfur dioxide content of said portion, and while simultaneously intimately intermingling with said portion a downward flow of a sufficient quantity of H_2O for sulfuric acid to be formed as the product of substantially all sulfur dioxide that is oxidized in said reactor tower means, at least approximately 50% by weight of the sulfur dioxide passing through said reactor tower means being oxidized and formed into sulfuric acid within said reactor tower means,

passing to chamber means the gaseous mixture of air oxygen and nitrogen oxides and the flue gases remaining after movement of said portion through said reactor tower means,

moving said remaining gaseous mixture upwardly through said chamber means while simultaneously spraying H_2O downwardly through said remaining gaseous mixture, to thereby effect further conversion of oxidized sulfur dioxide into sulfuric acid,

passing to absorption tower means the residual gaseous mixture from said chamber means,

substantially removing the nitrogen oxides from said residual gaseous mixture as it passes through said absorption tower means,

passing the final gaseous mixture resulting from the treatment in the absorption tower means into an exhaust stack,

discharging said final gaseous mixture into the atmosphere,

and simultaneously as the foregoing steps are conducted continuously,

withdrawing sulfuric acid from said reactor tower means, and

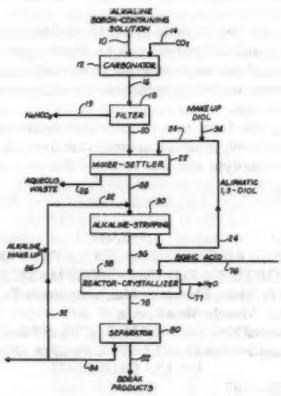
recycling the removed nitrogen oxides from the absorption tower means back into said reactor tower means.

4,557,913

BORAX RECOVERY USING SODIUM METABORATE AND BORIC ACID INTERMEDIATES

Robert E. Davis, and Wilbert J. Robertson, both of Oklahoma City, Okla., assignors to Kerr-McGee Chemical Corporation, Oklahoma City, Okla.

Filed Aug. 13, 1984, Ser. No. 640,363
Int. Cl.[4] C01B *35/12*
U.S. Cl. 423—279 **23 Claims**



1. A process for recovering sodium tetraborate from boron-containing feed solutions which comprises:

contacting a first feed solution having a pH of between about 5 and about 8 in a first separation zone with an aliphatic 1,3-diol to produce a boron-rich first organic phase and a boron-depleted first aqueous phase;

separating the first aqueous phase from the first organic phase;

extracting the boron values from the boron-rich first organic phase with an aqueous solution comprising an alkali metal hydroxide in a second separation zone, to produce a second aqueous phase rich in sodium metaborate and a boron-depleted second organic phase;

separating the second aqueous phase from the second organic phase;

contacting a second feed solution having a pH of greater than about 7 with a water-insoluble aromatic polyol in a third separation zone, to produce a boron-depleted third aqueous phase and a boron-rich third organic phase;

separating the third aqueous phase from the third organic phase;

contacting the third organic phase with mineral acid in a fourth separation zone, to produce a fourth aqueous phase rich in boric acid and a boron-depleted fourth organic phase;

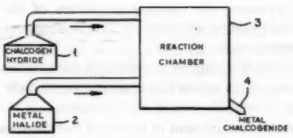
separating the fourth aqueous phase from the fourth organic phase; and

reacting sodium metaborate from the second aqueous phase with boric acid from the fourth aqueous phase to produce a fifth aqueous phase rich in sodium tetraborate.

4,557,914
PROCESS FOR PRODUCING SUBSTANCES OPTICALLY TRANSPARENT TO INFRARED RAYS

Eros Modone, Turin, Italy, assignor to CSELT - Centro Studi e Laboratori Telecomunicazioni S.p.A., Turin, Italy

Filed Jun. 29, 1984, Ser. No. 626,053
Claims priority, application Italy, Jun. 30, 1983, 67715 A/83
Int. Cl.⁴ C01B *19/04, 17/00, 25/14*
U.S. Cl. 423—303 **4 Claims**



1. In the production of shaped glass articles transparent to infrared radiation from chalcogenides, the improvement which consists of the process of forming said chalcogenides by the steps of:

(a) vaporizing in a first vessel at least one chalcogen hydride selected from the group which consists of dihydrogen sulfide, dihydrogen selenide and dihydrogen telluride to produce a chalcogen hydride vapor;

(b) vaporizing in a second vessel at least one chloride salt of a metal or metalloid selected from the group which consists of As, Sb, Zn, Ge, Sn, P, Si and Cd to produce a vapor thereof;

(c) separately feeding the vapors produced in steps (a) and (b) to a reaction chamber containing only said vapors and preheated to a temperature below the melting point of said chalcogenides but sufficient to induce reaction of said vapors in said chamber to produce said chalcogenides;

(d) effectuating said reaction in said chamber by double substitution under nonreducing and nonoxidizing conditions at a temperature below the melting point of said composition, thereby precipitating the chalcogenides as a solid from the reaction in said chamber; and

(e) discharging the precipitated chalcogenides in solid form from an outlet of said chamber.

4,557,915
PRODUCTION OF PHOSPHORIC ACID

Guy Nineuil, Bihorel, France, assignor to Rhone-Poulenc Chimie de Base, Courbevoie, France

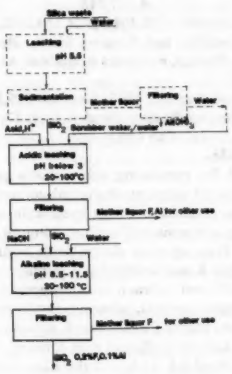
Filed Jul. 5, 1984, Ser. No. 627,672
Claims priority, application France, Jul. 5, 1983, 83 11140
Int. Cl.⁴ C01B *25/16*
U.S. Cl. 423—319 **20 Claims**

1. A process for the production of phosphoric acid, comprising (a) acidulating a first amount of phosphate ore with a strong acid to produce a first phosphoric acid slurry, (b) filtering said first slurry to separate the liquid phosphoric acid content therefrom, (c) concentrating a fraction of the phosphoric acid thus separated, (d) recovering same, and (e) condensing the evolved vapors of concentration with a liquid absorbent to produce a solution of fluosilicic acid, (f) acidulating a second amount of phosphate ore with said solution of fluosilicic acid together with a fraction of said first slurry, or together with a fraction of the phosphoric acid separated in the step (b), to produce a second phosphoric acid slurry, (g) filtering said second slurry to separate both the liquid phosphoric acid content and a solids fraction therefrom, said solids fraction comprising fluorine and silica compounds essentially in the form of chukhrovite, and (h) recycling the phosphoric acid thus separated from said second slurry to the step (i) and combining same with the fraction of separated phosphoric acid to be downstream concentrated in the step (a).

4,557,916
SYNTHETIC CALCIUM SILICATES AND METHODS OF PREPARATION

Michael C. Withiam, Elkton, Md., assignor to J. M. Huber Corporation, Locust, N.J.

Filed Oct. 22, 1984, Ser. No. 663,955
Int. Cl.⁴ C01B *33/28*
U.S. Cl. 423—328 **8 Claims**



1. An amorphous alkaline earth metal silicate of the following formula:

$$(0.10\text{–}720)Me:(0.005\text{–}100)B_2O:Al_2O_3:(1.0\text{–}400)Si\text{-}O_2:XH_2O$$

wherein Me an is alkaline earth metal, B is an alkali metal, and X is an integer of 1 to 3.

3. A method for the preparation of an amorphous alkaline earth metal silicate of the formula:

$$(0.10\text{–}720)Me:(0.005\text{–}100)B_2O:Al_2O_3:(1.0\text{–}400)Si\text{-}O_2:XH_2O$$

wherein Me an alkaline earth metal, B is an alkali metal, and X

is an integer of 1 to 3, which comprises adding an alkaline earth metal hydroxide or oxide to an aqueous medium of a reactive silica and an alumina to produce a batch composition containing ratios of reactants on a molar basis of alkaline earth metal oxide to SiO_2 of 0.10:1 to 1.8:1, SiO_2 to Al_2O_3 of 1:1 to 21:1, and SiO_2 to Al_2O_3 of 1:1 lto 400:1, reacting under conditions of pressures ranging from atmospheric to 400 psi and temperatures ranging from ambient to 230° C., and recovering the alkaline earth metal silicate as a solid.

4,557,917
SYNTHESIS OF ZEOLITE ZSM-5 WITH ANIONIC ORGANIC COMPOUNDS

Ernest W. Valyocsik, Yardley, Pa., and Eric G. Derouane, Hopewell, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 30, 1984, Ser. No. 595,232
Int. Cl.[4] C01B *33/28*
U.S. Cl. 423—328 **12 Claims**

1. A synthetic crystalline ZSM-5 zeolite material having the formula, in terms of mole ratios of oxide, in the anhydrous state as follows:

$(0.02–10)R_2O:(0.1–2)M_{2/n}O:(0.1–3.3)Al_2O_3:100SiO_2$

wherein R is represented by the formula:

$$R''—O—R'—O^-—A^{m+}_{1/m}$$

wherein A is a cation having a valence m, R' is a sulfonated succinic acid group and R'' is an ethoxylated alkyl group having 8 to 12 carbon atoms in the alkyl chain or an ethoxylated phenol alkyl group having 8 to 12 carbon atoms in the alkyl chain, and M is an alkali metal or an alkaline earth metal having a valence n, and having the X-ray powder diffraction pattern substantially as set forth in Table I of the specification.

4,557,918
METHOD FOR PRODUCING SILICA

Gösta B. Lagerström, and Lennart H. A. Berglund, both of Helsingborg, Sweden, assignors to Boliden Aktiebolag, Stockholm, Sweden

Filed Aug. 22, 1983, Ser. No. 525,312
Claims priority, application Sweden, Oct. 13, 1982, 8205825
Int. Cl.[4] C01F *7/02, 7/50*
U.S. Cl. 423—335 **9 Claims**

1. A method for producing substantially pure silica from waste silica obtained when producing aluminium fluoride from hexafluosilicic acid and aluminium hydroxide, characterized in that silica being contaminated with aluminium and fluorine, is provided, in a first, aqueous slurry, with hydrogen ions to a final pH of below 3, and leached at a temperature of 20°–100° C. for a time sufficient to leach out substantially all aluminium and part of fluorine present, whereupon the insoluble silica is isolated, and then slurried in a second, aqueous slurry, whereupon hydroxyl ions or hydroxyl ions forming compounds are provided to a pH of 8.5–11.5, and the silica is further leached at a temperature of 20°–100° C. for a time sufficient to leach out remaining fluorine, whereupon finally substantially pure silica is isolated, and washed with water.

4,557,919
PRODUCTION OF CRYSTALLINE ZEOLITES

Koji Sumitani; Tokuji Sakai; Yasuo Yamasaki, and Tamio Onodera, all of Matsuyama, Japan, assignors to Teijin Petrochemical Industries Ltd., Tokyo, Japan

Filed Apr. 10, 1984, Ser. No. 598,691
Claims priority, application Japan, Apr. 12, 1983, 58-63052; Jul. 5, 1983, 58-120952
Int. Cl.[4] C01B *33/28*
U.S. Cl. 423—329 **13 Claims**

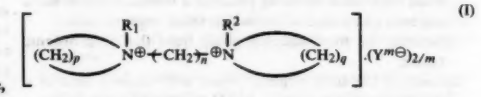
1. A process for producing crystalline zeolite TPZ-12, which comprises maintaining a starting mixture at a temperature of at least 80° C. for a period sufficient to produce zeolite crystals, said starting mixture consisting of

(a) a substance capable of yielding silica under the reaction conditions,

(b) a water-soluble alkali metal compound,

(c) water, and

(d) a diammonium compound represented by the following general formula



(I)

wherein R_1 and R_2 are identical or different and each represents an alkyl group having 1 to 4 carbon atoms, p and q are identical or different and each represents an integer of 4 or 5, n is 4, 5 or 6, and y represents an anion having a valence of m, and optionally,

(e) a substance capable of yielding alumina under the reaction conditions,

in the quantities represented by the following expressions

$$15 \leqq [SiO_2]/[Al_2O_3]$$

$$1\times10^{-4} \leqq [A]/([Si]+[Al]) \leqq 1$$

$$1\times10^{-4} \leqq [OH]/([Si]+[Al]) \leqq 0.5$$

$$5 \leqq [H_2O]/([Si]+[Al]) \leqq 100$$

$$1\times10^{-5} \leqq [OH]/[H_2O] \leqq 1\times10^{-1}$$

wherein

[SiO_2] represents the amount in moles of the substance capable of yielding silica under the reaction conditions calculated as SiO_2,

[Al_2O_3] represents the amount in moles of the substance capable of yielding alumina under the reaction conditions calculated as Al_2O_3,

[Si] represents the amount in moles of the substance capable of yielding silica under the reaction conditions calculated as Si,

[Al] represents the amount in moles of the substance capable of yielding alumina under the reaction conditions calculated as Al,

[A] represents the amount in moles of the diammonium compound,

[H_2O] represents the amount in moles of water, and

[OH] represents the total amount in moles of the alkali metal compound and the diammonium compound calculated as OH.

4,557,920
PROCESS FOR MAKING FUMING NITRIC ACID

Edwin F. Rissmann, Annandale, and Kendall B. Randolph, Arlington, both of Va., assignors to Versar Inc., Springfield, Va.

Filed Oct. 17, 1983, Ser. No. 542,809
Int. Cl.[4] C01B *21/40*
U.S. Cl. 423—393 **4 Claims**

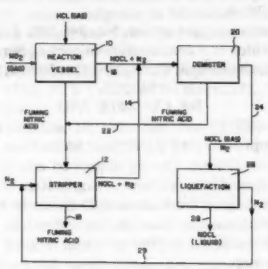
1. A gas-phase reaction process for making fuming nitric acid exclusively from dry gaseous NO_2 and dry gaseous HCl consisting of the steps of:

(a) reacting said dry nitrogen dioxide gas with said dry hydrogen chloride gas to directly produce liquid droplets of fuming nitric acid and nitrosyl chloride gas;

(b) collecting the droplets of fuming nitric acid as a liquid and stripping the liquid to remove nitrosyl chloride and other trace gases dissolved therein;

(c) collecting the nitrosyl chloride gas and any stripped trace

gases and demisting them to recover entrained fuming nitric acid therefrom; and



(d) recovering the liquid fuming nitric acid produced by said process.

4,557,921

PURIFICATION OF HALIDE

Warren B. Kirsch, Baton Rouge, and Sebastian M. Laurent, Greenwell Springs, both of La., assignors to Ethyl Corporation, Richmond, Va.

Filed Jun. 27, 1984, Ser. No. 625,355

Int. Cl.[4] C01B *7/07*; B01D *53/00*

U.S. Cl. 423—488 **23 Claims**

1. A method of purifying gaseous silicon tetrafluoride contaminated with at least one member selected from the group consisting of sulfur dioxide and HX where X is a halide, said method comprising the steps of contacting gaseous silicon tetrafluoride with an acidstable mordenite zeolite that selectively removes said at least one member and recovering the purified gaseous silicon tetrafluoride.

4,557,922

PROCESS FOR PREPARATION OF CHALCOGENS AND CHALCOGENIDE ALLOYS OF CONTROLLED AVERAGE CRYSTALLITE SIZE

Santokh S. Badesha, Ontario, and George T. Fekete, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 23, 1984, Ser. No. 603,019

The portion of the term of this patent subsequent to Jul. 17, 2001, has been disclaimed.

Int. Cl.[4] C01B *19/02*

U.S. Cl. 423—510 **15 Claims**

10. A process for the preparation of trigonal selenium of an average crystallite size of about 280 Angstroms consists essentially of providing a 20 percent solution of a diethyl selenite ester in an organic solvent, subjecting the resulting solution to a reduction reaction with hydrazine at a temperature of between about 40° C. to 45° C., and separating the resulting product from the reaction mixture.

4,557,923

METHOD FOR PRODUCING AMMONIUM METATUNGSTATE FROM AMMONIUM PARATUNGSTATE

John A. Powers, New Albeny, and James N. Christini, Towanda, both of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Apr. 29, 1985, Ser. No. 728,648

Int. Cl.[4] C01G *41/00*

U.S. Cl. 423—593 **9 Claims**

1. A method for producing ammonium metatungstate from ammonium paratungstate, said method comprising:

(a) roasting said ammonium paratungstate at from about 275° C. to about 300° C. for from about 10 hours to about 20 hours to remove some ammonia and some water and form a roasted ammonium paratungstate:

(b) adding said roasted ammonium paratungstate to a dilute solution of an ammonium metatungstate which is at a pH of from about 3.6 to about 4.2 at an elevated temperature, the rate of addition of said roasted ammonium paratungstate being such that a slurry is produced having a pH of from about 3.6 to about 4.2;

(c) adjusting the pH of said slurry to stabilize the pH at from about 3.6 to about 4.2;

(d) evaporating the resulting pH stabilized slurry to a fraction of its original volume to form a relatively concentrated ammonium metatungstate solution;

(e) separating said relatively concentrated ammonium metatungstate solution from any insoluble material; and

(f) crystallizing ammonium metatungstate from said relatively concentrated ammonium metatungstate solution.

4,557,924

METHOD OF PRODUCING CRYSTALLINE AMMONIUM METATUNGSTATE

Tai K. Kim, Towanda, and Robert P. McClintic, Monroeton, both of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Mar. 21, 1985, Ser. No. 714,295

Int. Cl.[4] C01G *41/00*

U.S. Cl. 423—593 **3 Claims**

1. A method of producing ammonium metatungstate from ammonium paratungstate, said method comprising:

(a) heating said ammonium paratungstate at from about 130° C. to about 400° C. for from about 1 hour to about 8.0 hours to remove some ammonia and some water and form a heated ammonium paratungstate;

(b) forming a slurry of said heated ammonium paratungstate and water;

(c) heating said slurry at from about 80° C. to about 100° C. at relatively constant volume until the pH of said slurry becomes stabilized at from about 5.8 to about 6.0;

(d) adjusting the pH of the resulting pH stabilized slurry to from about 4.2 to about 3.0 by introducing a porous container containing a strongly acidic cation exchange resin into the slurry, the amount of said resin being essentially sufficient to extract sufficient dissolved ammonium ions from the slurry to accomplish the pH adjustment;

(e) removing the container and resin from the resulting pH adjusted slurry;

(f) digesting the resulting pH adjusted slurry at from about 80° C. to about 100° C. for from about 2 hours to about 6 hours to form a solution of ammonium metatungstate;

(g) evaporating said solution to a fraction of its original volume to form a relatively concentrated ammonium metatungstate solution;

(h) separating any insoluble material from said concentrated ammonium metatungstate solution; and

(i) crystallizing ammonium metatungstate from said concentrated ammonium metatungstate solution.

4,557,925

MEMBRANE-COATED SUSTAINED-RELEASE TABLETS AND METHOD

Ake R. Lindahl, Skurup, and Stig A. B. Erlandsson, Malmo, both of Sweden, assignors to AB Ferrosan, Malmö, Sweden

Continuation of Ser. No. 396,391, Jul. 8, 1982, abandoned. This application Sep. 5, 1984, Ser. No. 647,928

Int. Cl.[4] A61K *9/28, 9/32*

U.S. Cl. 424—19 **17 Claims**

1. A sustained-release coated pharmaceutical tablet comprising a drug-containing tablet and a coating or membrane surrounding the same, wherein the coating or membrane is water-insoluble and insoluble in gastrointenstinal fluids and consists essentially of a terpolymer of polyvinylchloride, polyvinylacetate, and polyvinylalcohol and a water-soluble pore-creating

substance, the said pore-creating substance being randomly distributed in said terpolymer coating, said pore-creating substance being present in amount of one part to 35 parts for each one to ten parts of terpolymer, said coated tablet exhibiting a substantially constant dissolution rate during a major portion of its dissolution time when exposed to gastrointestinal fluids, wherein the terpolymer contains 80 to 95% weight per weight of polyvinylchloride, 0.5 to 19% weight per weight of polyvinylacetate, and 0.5 to 10% weight per weight of polyvinylalcohol.

4,557,926

METHOD AND TABLET FOR SANITIZING TOILETS

G. Douglas Nelson, and Steve Vazopolos, both of St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 529,830, Sep. 6, 1983. This application Jun. 10, 1985, Ser. No. 742,682

Int. Cl.[4] A61J *3/10;* **A61K** *27/12;* **C01B** *11/02*

U.S. Cl. 424—19 **8 Claims**

1. A tablet suitable for disinfecting flush toilets comprising from about 20% by weight to about 90% weight of an alkali metal salt of dichloroisocyanuric acid and at least 5% by weight of bromine salt selected from the group consisting of sodium bromide and potassium bromide, said tablet being essentially free of sodiun carbonate/bicarbonate buffer mixtures, and capable of prolonged release of chlorine through metered dispensers when immersed in water.

4,557,927

FOOD PRODUCTS AND PROCESS FOR PRODUCING SAME

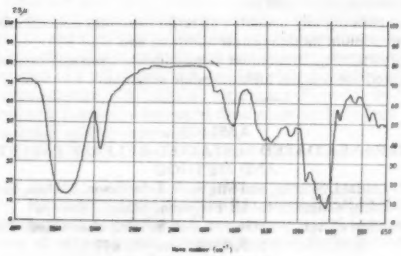
Toshio Miyake, Hiromi Hijiya, both of Okayama; Shinji Suzuki and Teruo Matsumoto, both of Tokyo, all of Japan, assignors to Kabushiki Kaisha Hoyoshibara, Okayama, Japan

Filed Feb. 22, 1984, Ser. No. 582,475

Claims priority, application Japan, Mar. 10, 1983, 58-40125; Apr. 11, 1983, 58-64183

Int. Cl.[4] C08B *37/00;* **A61K** *7/16;* **A23L** *1/236*

U.S. Cl. 424—48 **33 Claims**



1. A process for producing alpha-glycosyl soybean glycoside or a mixture containing same, which process comprises:

providing an aqueous solution containing a soybean glycoside and an alpha-glucosyl saccharide; and subjecting the solution to an alpha-glucosyl transferase.

4,557,928

ANTI-DANDRUFF CREAM RINSE CONDITIONER

David A. Glover, Carrollton, Tex., assignor to Amway Corporation, Ada, Mich.

Continuation-in-part of Ser. No. 395,502, Jul. 6, 1982, abandoned, which is a continuation-in-part of Ser. No. 302,100, Sep. 14, 1981, abandoned. This application Nov. 2, 1983, Ser. No. 547,927

Int. Cl.[4] A61K *7/08*

U.S. Cl. 424—70 **27 Claims**

1. In an improved zinc pyrithione water base anti-dandruff cream rinse conditioner having improved zinc pyrithione suspension wherein the improvement comprises:

the combination of from about 0.25 to about 5% by weight zinc pyrithione to provide an effective anti-dandruff agent, from about 0.25% to about 5% of by weight a cationic polymer and from about 0.5 to about 4% by weight of a combination of (1) one of glucan gum, guar gum or mixtures thereof wherein the glucan gum is a refined gum in powder form with a white to cream clear appearance, and having 90% glucan content, only 3% ash, 0.4% nitrogen and a viscosity of 2,100 to 2,400 and the guar gum is refined and having a viseosity at 25 degrees C. on the Brookfield viscometer, model RVF, in a 1% solution should be approximately 4,500 cps and (2) hydroxyethylcellulose, wherein said combination ingredients (1) and (2) have a proportional relationship of from about 3:1 to about 1:3 by weight with respect to one another.

4,557,929

SLOW RELEASE PESTICIDE FORMULATIONS

Robert D. Wysong, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 284,700, Jul. 22, 1981, Pat. No. 4,435,383, which is a continuation-in-part of Ser. No. 184,209, Sep. 5, 1980, abandoned. This application Jan. 27, 1984, Ser. No. 574,710

Int. Cl.[4] A61K *31/74;* **A01N** *25/10*

U.S. Cl. 424—78 **3 Claims**

1. A process for preparing a composition comprising a solid pesticidal composition consisting essentially of about 5 to 75 weight % pesticide in homogeneous combination with a cross-linked copolymer prepared from

(a) about 40 to 80% by weight of a hydrophobic barrier monomer selected from styrene and α-methyl styrene, and

(b) about 20 to about 60% by weight of unsaturated mono- or di-carboxylic acids in which all or part of the carboxy groups are in the anhydride form,

where 5 to 95% of the available carboxyl groups in said copolymer are cross-linked with a cross-linking agent selected from one or more (i) aromatic polyfunctional amines alone or, in combination with one or more aromatic polyfunctional isocyanates, aliphatic polyfunctional amines, polyols or polyfunctional epoxides, or (ii) aromatic polyfunctional isocyanates alone or, in combination with aromatic polyfunctional amines, aliphatic polyfunctional amines, polyols or polyfunctional epoxides, said process comprising simultaneously mixing and heating a mixture of the copolymer, the pesticide and the cross-linking agent to a temperature of about 60° to 150° C. but below the decomposition temperature of the pesticide until a homogeneous melt is produced, followed by cooling.

4,557,930

ANTICHOLESTEREMIC ANION EXCHANGE RESINS

Kunio Kihara; Hideo Toda; Motokuni Mori, and Koji Morooka, all of Amimachi, Japan, assignors to Mitsubishi Petrochemical Co., Ltd. and Mitsubishi Yuka Pharmaceutical Co., Ltd., both of Tokyo, Japan

PCT No. PCT/JP82/00016, § 371 Date Sep. 13, 1983, § 102(e) Date Sep. 13, 1983, PCT Pub. No. WO83/02392, PCT Pub. Date Jul. 21, 1983

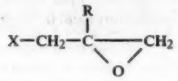
PCT Filed Jan. 18, 1982, Ser. No. 537,387

Int. Cl.[4] A61K *31/74*

U.S. Cl. 424—79 13 Claims

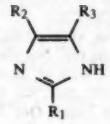
1. A method of reducing the level of cholesterol in blood, which comprises administering to a human being an anticholesteremic amount of a composition containing a water-insoluble anion exchange resin in combination with a pharmaceutically acceptable carrier, said water-insoluble anion exchange resin being a copolymer of:

(A) a reaction production of a halomethyl oxirane compound represented by formula (I):



[I]

wherein R is a hydrogen atom or a methyl group and X is a halogen atom, and an imidazole compound of formula (II):



[II]

wherein R_1 is a hydrogen atom, an alkyl group having 1 to 11 carbon atoms or an aryl group having 6 to 8 carbon atoms; R_2 and R_3, which may be identical or different, are each a hydrogen atom or an alkyl group having 1 to 3 carbon atoms, and

(B) a polyfunctional epoxy resin having at least two oxirane rings and an epoxy equivalence of 100 to 600,

said anion exchange resin having an imidazolium salt as the functional group with the counter-ion being selected from the group consisting of a halogen ion, a hydroxyl ion and $\frac{1}{2}$ (sulfate ion).

4,557,931

ANTIGENIC COMPOSITIONS AND METHODS FOR USING SAME

Reiko F. Irie; Tadashi Tai; Donald L. Morton; Leslie D. Cahan, and James C. Paulson, all of Los Angeles, Calif., assignors to Regents of the University of California, Berkeley, Calif.

Filed Dec. 2, 1982, Ser. No. 446,231

Int. Cl.[4] A61K *39/00;* G01N *33/54*

U.S. Cl. 424—88 12 Claims

1. An antigenic conjugate which is immunoreactive with anti-GM2 antibodies produced by mamallian tumors said antigenic conjugate consisting essentially of the oligosaccharide portion of GM2 conjugated to a non-toxic mammal compatible protein carrier.

9. A method for increasing the anti-GM2 titer in mammals in need of anti-GM2 therapy which comprises parenterally injecting into said mammals an anti-GM2 increasing titer effective amount of an antigenic composition which is immunoreactive with anti-GM2 antibodies produced by mammalian tumors, said antigenic composition consisting essentially of pure GM2 and a non-toxic stimulative immune response adjuvant.

4,557,932

ANTIBACTERIAL SYNERGISTIC PHARMACEUTICAL COMPOSITIONS

Leif Tybring, Olstykke, Denmark, assignor to Leo Pharmaceutical Products Ltd., Ballerup, Denmark

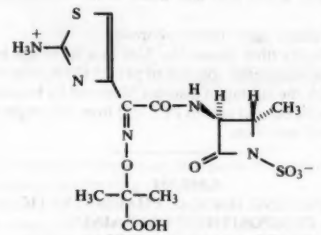
Filed Dec. 29, 1982, Ser. No. 454,491

Claims priority, application United Kingdom, Feb. 2, 1982, 8202905

Int. Cl.[4] A61K *35/00, 31/43, 31/425*

U.S. Cl. 424—114 9 Claims

1. An antibacterial synergistic composition consisting essentially of an effective amount of a synergistic mixture of (1) a compound of the formula I



(I)

or a pharmaceutically acceptable, non-toxic salt which in oral use is hydrolyzable in the body to give the free acid, and (2) mecillinam or a pharmaceutically acceptable, non-toxic salt which in oral use is hydrolyzable in the body to give mecillinam, the two components (1) and (2) being present in the ratio of 1:10 to 1:1 calculated as the free acids.

4,557,933

ANTIBIOTIC CALLED "CHLOROPOLYSPORIN", A PROCESS FOR ITS PREPARATION, AND ITS THERAPEUTIC AND VETERINARY USE

Tatsuo Haneishi; Takao Okazaki; Akio Torikata; Mutsuo Nakajima; Ryuzou Enokita; Toshiaki Katayama, and Seigo Iwado, all of Hiromachi, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

Filed Jul. 3, 1984, Ser. No. 627,439

Claims priority, application Japan, Jul. 15, 1983, 58-128851

Int. Cl.[4] A61K *35/74;* C12P *1/06*

U.S. Cl. 424—118 7 Claims

1. An antibiotic substance named chloropolysporin and characterized by the following properties:

(a) it takes the form of an amphoteric white powder, soluble in water;

(b) specific rotation: $[\alpha]^{25}-94.4°$ (C=0.09, 50%v/v aqueous methanol, sodium D-line);

(c) elemental analysis:
C, 49.88%; H, 5.44%; N, 5.65%; Cl, 5.20%;

(d) on acid hydrolysis it yields:
neutral saccharides: glucose, mannose and rhamnose; amino acids: monochloro-monohydroxy-phenylglycine;

(e) ultraviolet absorption spectrum:
as illustrated in FIG. 1 of the accompanying drawings, having absorption maxima λ_{max} at 280 nm ($E_{1cm}=45$) in a 0.01N solution of hydrochloric acid and at 300 nm ($E_{1cm}=54.2$) in a 0.01N aqueous solution of sodium hydroxide, the absorbences, E, being measured at a concentration of 1% w/v;

(f) infrared absorption spectrum:
the infrared absorption spectrum (νcm^{-1}) measured on a KBr disc is as shown in FIG. 2 of the accompanying drawings;

(g) nuclear magnetic resonance spectrum:
the nuclear magnetic resonance spectrum (δppm), measured at 400 MHz in a mixture of deuterium oxide and

deuterohydrochloric acid of pH value about 3.0, using sodium 2,2-dimethyl-2-silapentane-5-sulfonate as the internal standard, is as illustrated in FIG. 3 of the accompanying drawings;

(h) solubility:

soluble in water and methanol, sparingly soluble in acetone, and insoluble in ethyl acetate, chloroform and benzene;

(i) color reactions:

positive in Ninhydrin and Rydon-Smith reactions;

(j) thin layer chromatography:

Rf value=0.65, using a cellulose sheet (Eastman) as adsorbent and a 15:10:3:12 by volume mixture of butanol, pyridine, acetic acid and water as the developing solvent;

(k) high voltage paper electrophoresis:

using Toyo's filter paper No. 51A in a 0.1M tris-hydrochloric acid buffer solution of pH 7.5 (3300 volt/60 cm, 1 hour); the migration distance (detected by bioautography with *Bacillus subtilis* PCI 219) from the origin to the cathode was 4 cm.

4,557,934

PENETRATING TOPICAL PHARMACEUTICAL COMPOSITIONS CONTAINING 1-DODECYL-AZACYCLOHEPTAN-2-ONE

Eugene R. Cooper, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jun. 21, 1983, Ser. No. 506,275

Int. Cl.[4] A01N *59/26*; A61K *33/42*

U.S. Cl. 424—128 **23 Claims**

12. A penetration-enhancing pharmaceutical composition for topical application comprising:

(a) about 0.01% to about 10%, by weight, of a pharmaceutically-active bone-active organophosphate;

(b) 0% to about 80% by weight of a solvent selected from ethanol and 2-propanol;

(c) 0% to about 80% by weight water;

(d) about 15% to about 99% by weight of a penetration-enhancing diol or cycloketo compound selected from the group consisting of 1,2-propanediol, 1,3-propanediol, 1,2-butanediol, pyrrolidone, 1-(2-hydroxyethyl)azacyclopentan-2-one, and mixtures thereof;

(e) about 1.0% to about 35% by weight 1-dodecylazacycloheptan-2-one.

14. A penetration enhancing pharmaceutical composition for topical application comprising:

(a) about 0.01% to about 15% by weight of a sedative hypnotic or barbituate selected from the group consisting of amobarbital, aprobarbital, barbital, hexobarbital, mephobarbital, methohexital, pentobarbital, phenobarbital, probarbital, secobarbital, talbutal, thiamylal, thiopental, chlorodesmethyldiazepam, estazolam, flunitrazepam, flurazepam, fosazepam, lorazempam, nimetazepam, nitrazepam, nordiazepam, quazepam, triazolam, pyrithyldione, iminophenimide, ethinazone, mecloqualone, methaqualone, clomethizole, fenadiazole, ethinamate, hexapropymate, meprobamate, oxanamide, valnoctamide, butesamide, diethylallylacetamide, trimethobenzglycine, ibrotamide, capuride, ectylurea, apronalide, bromvalurea, acetylcarbromal, carbromal, amylene hydrate, chloretone, methylpentynol, brommethylpentynol, ethchlorvynol, methylphenylbutyndiol, paraldehyde, chloral hydrate and its derivatives, and mixtures thereof;

(b) 0% to about 80% by weight of a solvent selected from ethanol and 2-propanol;

(c) 0% to about 80% by weight water;

(d) about 25% to about 96% by weight of a penetration-enhancing diol or cycloketo compound selected from the group consisting of 1,2-propanediol, 1,3-propanediol, 1,2-butanediol, pyrrolidone, 1-(2-hydroxyethyl)-azacyclopentane-2-one, and mixtures thereof; and

(e) about 1.0% to about 35% by weight 1-dodecylazacycloheptan-2-one.

4,557,935

GERMICIDAL COMPOSITION

Bo T. af Ekenstam, Hjälteby; Per-Olof Glantz, Lund, and Kåre Larsson, Björred, all of Sweden, assignors to Biogram AB, Malmö , Sweden

Continuation of Ser. No. 441,529, filed as PCT SE82/00061, Mar. 8, 1982, published as WO82/03173, Sep. 30, 1982, § 102(e) date Nov. 4, 1982, abandoned. This application May 23, 1984, Ser. No. 613,207

Claims priority, application Sweden, Mar. 17, 1981, 8101678

Int. Cl.[4] A61K *33/40*

U.S. Cl. 424—130 **6 Claims**

1. A germicidal composition consisting essentially of an aqueous suspension containing 20–30 percent by weight of hydrophilic lipid crystals and 0.2–5 percent by weight of hydrogen peroxide, the hydrophilic lipid crystals being 10–100 percent by weight of 1-monolaurin and 0–90 percent by weight of 1-monomyristin.

4,557,936

SOYBEAN-BASED FIBROUS FOOD MATERIAL HAVING IMPROVED PRESERVABILITY AND TEXTURE

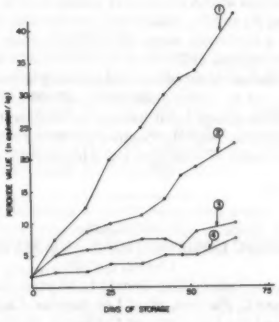
Shiro Kudo, Ito, and Kunihisa Akaba, Iida, both of Japan, assignors to Asahi-matsu Foods Inc., Nagano and Takeda Chemical Industries, Ltd., Osaka, both of, Japan

Filed Oct. 19, 1982, Ser. No. 435,394

Claims priority, application Japan, Oct. 30, 1981, 56-173848

Int. Cl.[4] A23J *3/00*; A23L *1/20*

U.S. Cl. 426—104 **17 Claims**



1. A fibrous food substance which comprises (1) a soybean-based fibrous food material produced by adjusting the water content of whole grains of soybean to between about 30 to about 60 weight percent and grinding said grains between two opposing disc grinding members separated by a gap not larger than 1 mm, wherein one of the grinding members rotates at a peripheral speed from 8 to 8000 m/min, and wherein the opposing discs are concave to form a central hollow portion therebetween having an approximately trapezoidal cross section, and having incorporated therein (2) about 1 to about 10 weight percent, based on said food substance, on a dry basis, of a polyhydric alcohol selected from the group consisting of propylene glycol, glycerol, sorbitol and reducing starch syrups; the water content of said food substance being about 6 to about 15 weight percent.

4,557,937

METHOD FOR BLANCHING MUSHROOMS AND OTHER VEGETABLES

Edgard Bournier, Fleury sur Andelle, France, assignor to M. Mario Spinoglio, Peronne, France

PCT No. PCT/FR82/00149, § 371 Date May 11, 1983, § 102(e) Date May 11, 1983, PCT Pub. No. WO83/00801, PCT Pub. Date Mar. 17, 1983

PCT Filed Sep. 10, 1982, Ser. No. 504,045

Claims priority, application France, Sep. 11, 1981, 81 17250

Int. Cl.⁴ A23B *7/06, 7/148*

U.S. Cl. 426—241 6 Claims

1. A method for preserving vegetables which comprises:

(a) cooling the vegetables to a temperature of from 0° C. to +2° C.,

(b) washing the vegetables with iced water and trimming the vegetables;

(c) cooling the trimmed vegetables to said temperature again,

(d) placing the trimmed and cooled vegetables in an enclosure at said temperature in which a vacuum of from 1 to 5 mm. Hg has been created,

(e) immersing the vegetables into at least one treatment liquid containing a coagulant at a temperature at which there is no evaporation and then increasing the pressure in one or more stages to achieve impregnation of the vegetables with the coagulant while maintaining the temperature at which no evaporation occurs, and

(f) coagulation-blanching the vegetables.

4,557,938

PRODUCT AND PROCESS FOR IMPROVING THE DISPERSION OF A VEGETABLE GUM IN WATER

Eugene H. Sander, Rte. 1, Box 83, Hayfield, Minn. 55940, and Douglas R. Cook, Hayfield, Minn., assignors to Eugene H. Sander, Hayfield, Minn.

Filed Aug. 17, 1983, Ser. No. 524,145

Int. Cl.⁴ A23L *1/04*

U.S. Cl. 426—453 27 Claims

1. A process for producing a particle having a vegetable gum component, the particle being characterized by quick dispersion in an aqueous solution, the process comprising:

dry blending a food grade particulate carrier and vegetable gum particles to obtain a dry blended mixture;

fluidizing the carrier/vegetable gum mixture with a gaseous stream;

intermittently spraying the mixture with a liquid spray while the mixture is in a fluidized state causing the surfaces of the particles to become tacky and the particles to stick to each other;

permitting the particles to dry between spraying intervals; and

continuing spraying and drying of the particles until agglomerated particles are produced having a moisture content of less than 25% by weight of the agglomerated particle.

4,557,939

METHOD FOR IMPROVING A HARDLY SOLUBLE GELLING AGENT

Ko Sugisawa, Nara; Masanori Yamamoto, Kaizuka; Masaru Shibuki, Kyoto; Yukihiro Nomura, Nara; Koji Sengoku, Nara; Seiji Higashine, Nara, and Hiroko Hioki, Osaka, all of Japan, assignors to House Food Industrial Co. Ltd., Osaka, Japan

PCT No. PCT/JP83/00338, § 371 Date Jun. 19, 1984, § 102(e) Date Jun. 19, 1984, PCT Pub. No. WO84/01492, PCT Pub. Date Apr. 26, 1984

PCT Filed Oct. 12, 1983, Ser. No. 621,930

Claims priority, application Japan, Oct. 19, 1982, 57-182104

Int. Cl.⁴ A23L *1/04*

U.S. Cl. 426—473 5 Claims

1. A method of improving qualities of a hardly soluble gelling agent which comprises contacting said gelling agent for a time period of less than 180 minutes with a non-equilibrium plasma which is generated under a reduced pressure of lower than 100 Torr. in a gas selected from the group consisting of air, nitrogen gas, oxygen gas and carbon dioxide gas by applying a high frequency wave.

4,557,940

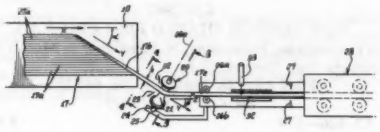
FISH SLURRY PROCESSING METHOD

Teisuke Suzuki, Montebello, Calif., assignor to JAC Creative Foods, Inc., Los Angeles, Calif.

Filed Nov. 15, 1982, Ser. No. 441,411

Int. Cl.⁴ A22C *25/00, 25/22*

U.S. Cl. 426—513 5 Claims



1. A method of processing fish paste or slurry to produce a fish product, comprising the steps of:

(a) forming said paste or slurry into a thin coherent sheet traveling in a direction "x" and around a roller, said roller having a rolling axis and an annular surface and is outwardly concave away from said axis in axial planes,

(b) progressively folding the traveling sheet to produce a spiral convolution sheet roll traveling in direction "y" which extends at an acute angle α between 30° and 60° relative to direction "x",

(c) exerting side loading on the traveling roll traveling in direction "y" to press together said spiral convolutions, said side loading exertion being carried out by employing said roller surface to sidewardly engage the roll and cause turning of the direction of roll travel into a direction "z" which extends at angle β relative to said direction "y", thereby allowing the sheet roll to twist and move back and forth on said roller surface to a limited extent such that said side loading is exerted on different side portions of the roll to tighten said convolutions into a coherent roll,

(d) supplying additional fish paste onto said sheet immediately prior to said roll formation thereby to cause said convolutions to adhere together in response to said side loading,

(e) and cutting off sections of the roll traveling in direction "z".

4,557,941

FLAVORING WITH MERCAPTO-C_2–C_3-ALKANOIC ACID ESTERS

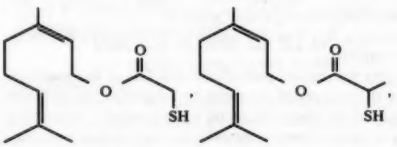
Alan O. Pittet, Atlantic Highlands; Ranya Muralidhara, Fair Haven, and Manfred H. Vock, Locust, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Mar. 25, 1985, Ser. No. 715,344

Int. Cl.⁴ A23L *1/226, 1/235*

U.S. Cl. 426—535 5 Claims

1. A process for augmenting or enhancing the aroma or taste of a foodstuff comprising the step of intimately admixing with said foodstuff at the rate of from about 0.001 ppm up to about 250 ppm of at least one compound selected from the group consisting of:



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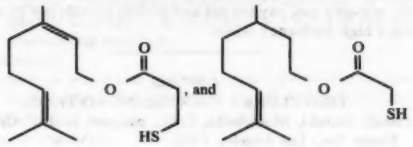


4,557,942

LOW SODIUM SHAPED FISH PRODUCT

Louis P. Goodman, Parsippany, N.J., assignor to Mother's Food Products, Inc., Newark, N.J.

Filed Aug. 28, 1984, Ser. No. 645,085
Int. Cl.[4] A23L *1/325*
U.S. Cl. 426—574 8 Claims

1. A substantially salt free integrally shaped fish product comprising comminuted fish substantially homogeneously dispersed within a gelled matrix binder formed by admixture of water with crosslinked, pregelatinized starch particles at a level of from 0.2 to 3% by weight of the fish product, said fish product having less than 40 mg of sodium per 100 grams.

4,557,943

METAL-SILICIDE DEPOSITION USING PLASMA-ENHANCED CHEMICAL VAPOR DEPOSITION

Richard S. Rosler, Paradise Valley, and George M. Engle, Scottsdale, both of Ariz., assignors to Advanced Semiconductor Materials America, Inc., Phoenix, Ariz.

Filed Oct. 31, 1983, Ser. No. 547,050
Int. Cl.[4] B05D *3/06*
U.S. Cl. 427—38 4 Claims

1. A method for the chemical vapor deposition of a low-resistivity composite layer comprising titanium silicide on a substrate by low-pressure plasma-enhanced vapor deposition, comprising the steps of:

depositing a thin layer of silicon on said substrate;

depositing a layer of titanium silicide on said thin layer of silicon by reacting a gaseous silicon species and a gaseous titanium species in a low-pressure plasma; and

depositing another layer of silicon on said layer of titanium silicide.

4,557,944

PROCESS OF MANUFACTURING A MAGNETIC RECORDING MEDIUM

Yoshihiro Arai, and Akira Nahara, both of Kanagawa, Japan, assignors to Fuji Photo Film Company Limited, Japan

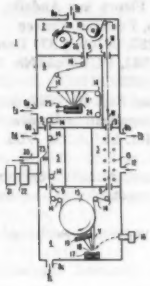
Division of Ser. No. 364,271, Apr. 1, 1982, Pat. No. 4,495,242. This application Jan. 18, 1985, Ser. No. 656,792
Claims priority, application Japan, Apr. 2, 1981, 56-49883; Apr. 2, 1981, 56-49885; Apr. 2, 1981, 56-49886
Int. Cl.[4] H01F *10/02*
U.S. Cl. 427—39 3 Claims

1. A process for manufacturing a magnetic recording medium, comprising the sequential steps of:

evaporating a thin film of a magnetic metal onto a non-magnetic support;

converting the surface part of said thin film of the magnetic metal to the layer of the oxide by subjecting the thin film surface of the magnetic metal to an oxidizing processing with oxygen plasma generated by high voltage application; and

forming, under a succeeded vacuum condition, on the converted surface part of the magnetic metal film a protecting



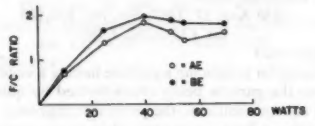
film of a high molecular weight compound, a higher fatty acid, a fatty acid ester or a combination thereof.

4,557,945

PROCESS FOR FLUORINATION BY INORGANIC FLUORIDES IN GLOW DISCHARGE

Toshiharu Yagi, 1-4-23 Hanayashiki-Soen, Takarazuka-Shi, Hyogo 665, Japan, and Attila E. Pavlath, 115 Hogan Ct. #4, Walnut Creek, Calif. 94598

Division of Ser. No. 385,674, Jun. 7, 1982, Pat. No. 4,508,781. This application Apr. 1, 1985, Ser. No. 718,335
Int. Cl.[4] B32B *27/00;* B05D *3/06*
U.S. Cl. 427—40 23 Claims



1. A process for fluorinating essentially the surface of a carbon-containing synthetic or natural polymer capable of forming a carbon-fluorine bond on fluorination with fluorine radicals comprising

a. introducing a polymer surface to be fluorinated into an activated glow discharge reactor; and

b. subjecting said surface within said reactor to dissociated inorganic fluoride vapors for a predetermined exposure time period.

4,557,946

MOISTURE IMPERMEABILITY OR ORGANOSILICONE FILMS

Edward Sacher, 5796 Melling Ave., Cote St. Luc, Quebec, Canada H4W 2C7; Michael R. Wertheimer, 910 Somerville Ave., Westmount, Quebec, Canada H3Z 1J4, and Henry P. Schreiber, 441 Fortier St., St. Hilaire, Quebec, Canada J3H 2X6

Filed Jun. 3, 1983, Ser. No. 500,810
Int. Cl.[4] B05D *3/06*
U.S. Cl. 427—41 7 Claims

1. A method of forming a protective film having a controlled moisture permeability on a substrate, said protective film comprising a plasma polymerized organosilicone material having an inorganic component, the proportion of said inorganic component in said film determining its moisture permeability, said method comprising:

(a) providing a substrate to be protected;

(b) heating said substrate to a temperature of between 25° and 1000° C.;

(c) plasma polymerizing an organosilicone film on said substrate; and

(d) controlling the power level of the plasma in step (c) to between 0.1 and 10 watts per cubic centimeter, the power level and the substrate temperature determining the proportion of inorganic component in said film.

4,557,947

PROCESS FOR POLISHING THE SURFACES OF MAGNETIC STORAGE DISKS

Karl Deimling, Willstaett; Roland Falk, Achern; Aribert Krug, Achern-Fautenbach; Peter Nagel, and Rudolf Sand, both of Willstaett, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 4, 1980, Ser. No. 127,085

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1979, 2910807

Int. Cl.⁴ H01F *10/02*

U.S. Cl. 427—130 **4 Claims**

1. A process for polishing the surfaces of the ground magnetic coatings of magnetic storage disks, said disks consisting essentially of a rigid substrate provided on both sides with a firmly adhering magnetic coating of a magnetic material finely dispersed in a cured organic binder, which process comprises; pressing a felt ring or felt disk against the surfaces of the magnetic storage disks as they are rotated alternately in opposite directions, said felt ring or felt disk having applied thereto

an aqueous emulsion consisting essentially of water, one or more emulsifiers and from 2 to 25% by weight of butyl acetate, based on the weight of the emulsion, and thereafter rinsing the disks to remove the emulsion and any abraded material contained therein.

4,557,948

PROCESS FOR PRODUCING MAGNETIC RECORDING MATERIALS

Nobuyuki Yamamoto, Kanagawa; Masao Yabe, Shizuoka; Yasuo Nishikawa, Kanagawa; Akio Yanai, Kanagawa; Ryuji Shirahata, Kanagawa, and Kyoichi Naruo, Kanagawa, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 493,880, May 12, 1983, abandoned. This application Aug. 6, 1984, Ser. No. 637,703

Claims priority, application Japan, May 12, 1982, 57-80600

Int. Cl.⁴ H01F *10/02;* **B05D** *5/12*

U.S. Cl. 427—131 **11 Claims**

1. A process for producing a magnetic recording medium which comprises the steps of:

coating a thin magnetic metal layer having a water contact angle of at least 25° provided on a support with a polymer solution to form a thin polymer layer on said thin magnetic metal layer,

drying the thin polymer layer, and

providing a lubricant on the thin polymer layer,

wherein said lubricant is selected from the group consisting aliphatic acids, metallic soaps, aliphatic acid amides, aliphatic acid esters, higher alcohols, and mixtures thereof and wherein said polymer is a thermoplastic resin.

4,557,949

METHOD OF MAKING A REVERSE OSMOSIS SEMIPERMEABLE MEMBRANE

Masaru Kurihara; Tetsuo Watanabe, both of Ohtsu, and Tetsuo Inoue, Shiga, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Continuation of Ser. No. 196,164, Oct. 14, 1980, abandoned, which is a continuation of Ser. No. 9,431, Feb. 5, 1979, abandoned. This application Feb. 1, 1984, Ser. No. 575,721

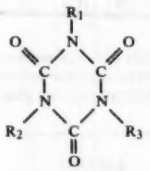
Claims priority, application Japan, Feb. 13, 1978, 53-14046

Int. Cl.⁴ B05D *5/00, 3/02*

U.S. Cl. 427—244 **24 Claims**

1. A process of preparation of a semipermeable composite membrane comprising:

(a) applying to the surface of a porous substrate an aqueous solution containing (A) at least one component selected from the group consisting of (i) a component defined by the Formula (I) or reaction products formed between a plurality of components of the formula:



(I)

wherein each of R_1, R_2, and R_3 is selected from the group consisting of hydrogen, an alkyl radical containing from 2 to 5 carbon atoms, and an alkyl radical carrying a functional hydroxyl group or a functional glycidyl group, with the proviso that at least two of R_1, R_2, and R_3 comprise alkyl radicals carrying a functional hydroxyl group or a functional glycidyl group, (ii) reaction products between a compound defined as group (i) and at least one water soluble comonomer selected from the group consisting of furfuryl alcohol, tetrahydrofurfuryl alcohol, an epoxy compound containing from 2 to 5 carbon atoms, a multivalent alcohol containing from 2 to 8 carbon atoms, polyethylene oxide, a multivalent carboxylic acid containing from 2 to 17 carbon atoms, multivalent hydroxy acid containing from 2 to 17 carbon atoms and formaldehyde, and (iii) a mixture of reaction products between the compounds defined as group (i) and at least one water soluble comonomer selected from the group consisting of furfuryl alcohol, tetrahydrofurfuryl alcohol, an epoxy compound containing from 2 to 5 carbon atoms, a multivalent alcohol containing from 2 to 8 carbon atoms, polyethylene oxide, a multivalent carboxylic acid containing from 2 to 17 carbon atoms, a multivalent hydroxy acid containing from 2 to 17 carbon atoms and formaldehyde, and (B) an acid catalyst, and

(b) heating the solution to polymerize the compound represented by the Formula (I) and/or said comonomer at a temperature of from about 100° C. to 190° C. for a period of about one minute to about 30 minutes.

4,557,950

PROCESS FOR DEPOSITION OF BOROPHOSPHOSILICATE GLASS

Thomas C. Foster, Sunnymead; Jon C. Goldman, Orange, and Gary W. Hoeye, Santa Ana, all of Calif., assignors to Thermco Systems, Inc., Orange, Calif.

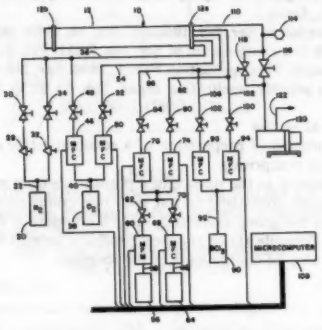
Filed May 18, 1984, Ser. No. 611,793

Int. Cl.⁴ C23C *11/00, 13/00*

U.S. Cl. 427—255 **14 Claims**

1. A process for the chemical vapor deposition at low pressure of borophosphosilicate glass on a silicon wafer comprising the steps of: placing a silicon wafer to be treated in a process chamber; reducing a pressure within said process chamber to a

subatmospheric pressure; heating said silicon wafer; contacting said silicon wafer with a mixture of gaseous compounds containing silicon, oxygen and phosphorus; contacting said silicon



wafer with a boron halide gas; and reacting said silicon, oxygen, phosphorus gaseous compounds and said boron halide gas to form a layer of borophosphosilicate glass upon a surface of said silicon wafer.

4,557,951

CELLULOSIC ORGANIC SOLVENT SOLUBLE PRODUCTS

Frank Verbanac, Decatur, Ill., assignor to A. E. Staley Manufacturing Company, Decatur, Ill.

Continuation-in-part of Ser. No. 554,216, Nov. 22, 1983, Pat. No. 4,490,516. This application Oct. 29, 1984, Ser. No. 665,883

The portion of the term of this patent subsequent to Dec. 25, 2001, has been disclaimed.

Int. Cl.[4] C08B *15/06, 15/10*

U.S. Cl. 527—312 **20 Claims**

1. A polymerizable cellulosic ester or ether product which is capable of homopolymerization and copolymerization with vinyl monomers and which is soluble in organic solvents and in vinyl monomers, said product having an ester or ether degree of substitution of between 2.0 and about 2.9 and being characterized by having been reacted with an acrylamide reactant containing a methylol or methylthiol group so as to attach pendant acrylamide functionality corresponding to an acrylamide functionality degree of substitution of at least about 0.05.

4,557,952

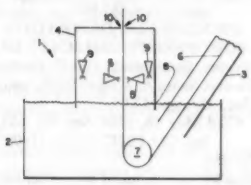
PROCESS FOR CONTROLLING ZINC VAPOR IN A FINISHING PROCESS FOR A HOT DIP ZINC BASED COATING ON A FERROUS BASE METAL STRIP

David S. Mitch, Fairfield; Lloyd W. Abrams, Gratis; Jerry L. Arnold, Franklin; Forrester Caudill, Middletown; Thomas A. Compton, Middletown, and Steven L. Boston, Middletown, all of Ohio, assignors to Armco Inc., Middletown, Ohio

Filed Jul. 30, 1984, Ser. No. 635,512

Int. Cl.[4] B05D *1/18*

U.S. Cl. 427—432 **17 Claims**



1. In a process for continuously hot dip coating at least one side of a ferrous base metal strip with a zinc base metal including an enclosure surrounding the coated strip and at least a portion of the zinc base metal coating bath, said enclosure containing an atmosphere having less than about 1000 ppm molecular oxygen, the improvement which comprises injecting and maintaining sufficient high dew point atmosphere having at least about 0.3% water vapor by volume in the enclosure to suppress zinc vapor formation.

4,557,953

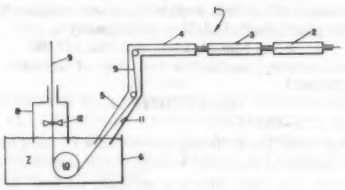
PROCESS FOR CONTROLLING SNOUT ZINC VAPOR IN A HOT DIP ZINC BASED COATING ON A FERROUS BASE METAL STRIP

Steven L. Boston; Forrester Caudill, both of Middletown, and Jerry L. Arnold, Franklin, all of Ohio, assignors to Armco Inc., Middletown, Ohio

Filed Jul. 30, 1984, Ser. No. 635,513

Int. Cl.[4] C23C *1/02*

U.S. Cl. 427—432 **14 Claims**



1. A process for suppressing zinc vapor formation in a continuous hot dip coating process having a hot dip coating consisting essentially of zinc, wherein the strip is enclosed in an entrance snout, comprising the step of maintaining an atmosphere within said entrance snout which is oxidizing to said zinc vapor but not oxidizing to said ferrous strip, said atmosphere within said entrance snout including a minimum 4:1 hydrogen/water vapor ratio.

4,557,954

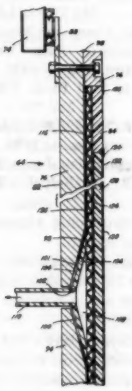
THREE-DIMENSIONAL PHOTOGRAPH

Gregory E. Gundlach, and Grayson Marshall, both of 1446 W. Grace, Chicago, Ill. 60613

Continuation of Ser. No. 417,855, Sep. 14, 1982, Pat. No. 4,481,050. This application May 17, 1984, Ser. No. 611,484

Int. Cl.[4] B44F *7/00*

U.S. Cl. 428—29 **27 Claims**



19. A three-dimensional photograph comprising, in combination:

a line rastor having parallel lineations of alternately opaque and optically clear portions, said parallel lineations being of a predetermined periodicity;

an exposed and developed, dimensionally stable film stock having parallel linear images;

translucent spacing means for (a) separating said line rastor from said film stock by a predetermined distance, (b) maintaining said line rastor parallel to said film stock, and (c) providing a refractive medium between the line rastor and film stock, said linear images on the dimensionally stable film stock being positioned with respect to the line rastor so that a three-dimensional image appears on the side of the line rastor furthest from the dimensionally stable film stock; and

means for intimately attaching said line rastor to said spacing means and for intimately attaching said dimensionally stable film stock to said spacing means.

4,557,955

SHAPED ARTICLES WHICH ARE COMPOSED OF A COPOLYMER CONTAINING FLUORINE GROUPS AND WHICH ARE SELECTIVELY PERMEABLE TO LIQUIDS AND GASES AND ARE SIMULTANEOUSLY OLEOPHOBIC AND OLEOPHILIC

Axel Walch, Frankfurt; Walter Seifried; Wolfgang Michel, both of Wiesbaden; Jürgen Kuhls, Burghausen, and Jürgen Wildhardt, Huenstetten, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 27, 1982, Ser. No. 402,265

Claims priority, application Fed. Rep. of Germany, Jul. 28, 1981, 3129744

Int. Cl.[4] B01D *39/16*

U.S. Cl. 428—35 **35 Claims**

1. A shaped article which is selectively permeable to liquids and gases, comprising a polymeric material which is comprised of at least 50% by weight of a copolymer comprising from about 20 to 80% by weight, relative to the total weight of the copolymer, of a copolymerized fluorinated olefin, from about 0 to 40% by weight, relative to the total weight of the copolymer, of a copolymerized olefin and from about 80 to 20% by weight, relative to the total weight of the copolymer, of copolymerized vinyl acetate, wherein at least about 5% by weight of the acetate groups in said copolymer relative to the total quantity thereof in the copolymer, have been converted into OH groups by saponification of said copolymer after the comonomers have been copolymerized to form the copolymer, and wherein the shaped article comprises a precipitation-induced selectively permeable, microporous, open-pore structure which is simultaneously olephilic and oleophobic.

24. A process for the preparation of a shaped article as claimed in claim 1, comprising the steps of:

providing a liquid solution which includes 1 to 50%, by total weight, of polymeric solute which comprises at least 50% by weight of a copolymer which is comprised of 20 to 80% by weight, relative to the total weight of the copolymer, of a copolymerized fluorinated olefin, from about 0 to 40% by weight, relative to its total weight, of a copolymerized olefin and from about 80 to 20% by weight, relative to its total weight, of copolymerized vinyl acetate;

saponifying at least 5% by weight of the acetate groups in the copolymer, relative to the total quantity thereof in the copolymer, into OH groups after the comonomers have been copolymerized to form said copolymer;

forming a shaped article from the liquid solution; and

coagulating the copolymer by treating the shaped article with a precipitation liquid to form a shaped article having a porous structure and a stable shape.

33. A process for modifying the structure of a shaped article as claimed in claim 1, comprising the steps of:

subjecting a shaped article to the action of a chemical agent which is capable of rendering the structure of the copolymer of which the shaped article is formed physically or optically homogeneous.

4,557,956

DEFORMABLE CONTAINER WITH FILLER UNIT

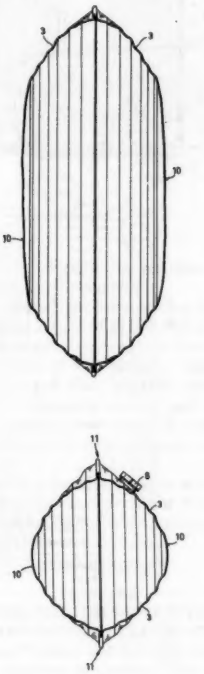
Fritz Volpert, and Hans-Werner Stöcker, both of Bad Berleburg, Fed. Rep. of Germany, assignors to Luwa AG, Zürich, Switzerland

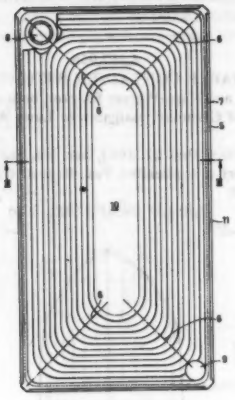
Filed Dec. 21, 1983, Ser. No. 563,743

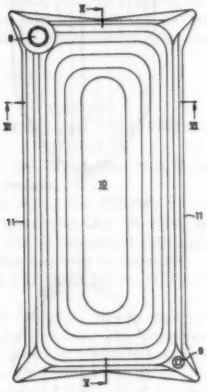
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1982, 3247759

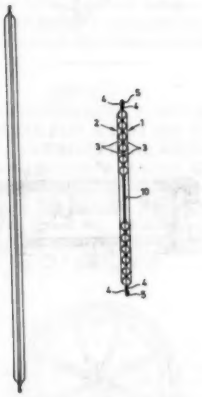
Int. Cl.[4] B65D *37/00, 7/46*

U.S. Cl. 428—35 **4 Claims**









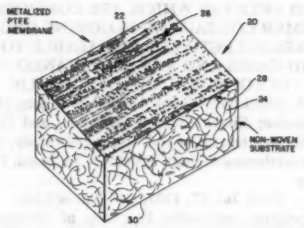
1. In a container made of deformable sheet material, having two panels generally facing one another and having perimetric edge portions bonded fluidtight to one another; the perimetric edge portions of one of said panels being folded over perimetric edge portions of the other of said panels; the improvement comprising deformation-enhancing corrugations provided in at least one of said panels whereby said container is expandable from a flat state into an inflated state; said one panel including a perimeter and said corrugations extending approximately parallel to said perimeter; said sheet material of at least said one panel being a drawable metal; and filler means provided in one of said panels for allowing a fluid to be introduced into and to be withdrawn from said container.

4,557,957

MICROPOROUS METAL-PLATED POLYTETRAFLUOROETHYLENE ARTICLES AND METHOD OF MANUFACTURE

James L. Manniso, Newark, Del., assignor to W. L. Gore & Associates, Inc., Newark, Del.

Filed Mar. 18, 1983, Ser. No. 476,839
Int. Cl.[4] F16L *11/04*; B32B *15/08, 27/12, 27/32*
U.S. Cl. 428—36 **33 Claims**



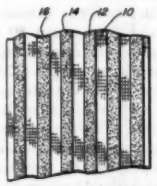
1. A metal-coated article wherein said article is a microporous polytetrafluoroethylene tube having a micro-structure of nodes interconnected by fibrils, said metal coating substantially encapsulating at least some of the individual nodes and fibrils, the tube having inner and outer surfaces, said tube also being flexible and electrically conductive through at least a portion of the microporous structure while retaining porosity.

4,557,958

NON-FRAYING, BREATHABLE FABRIC SUITABLE FOR USE AS A COTTON BALE COVER AND BAG FABRIC, APPARATUS AND METHOD FOR MAKING THE SAME

Edward D. Barkis, Marietta, Ga.; Douglas G. Moore, Wadley, Ala.; Allen M. Fernald, Douglasville, and Felton L. McClellan, Nashville, both of Ga., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Jul. 3, 1984, Ser. No. 627,359
Int. Cl.[4] B32B *3/00*
U.S. Cl. 428—36 **15 Claims**



1. A fabric suitable for use as a cotton bale cover or bag fabric comprising a woven polyolefin substrate with a series of stripes of a thermoplastic resin fused thereto, said stripes preventing fraying of said substrate when said fabric is cut.

4,557,959
MULTILAYER MEDICAL WORKING MEANS

Georg Kuehlein, Roeslau, and Ernst Geriach, Rehau, both of Fed. Rep. of Germany, assignors to Rehau Plastiks AG & Co., Rehau, Fed. Rep. of Germany

Filed Feb. 15, 1983, Ser. No. 467,191
Int. Cl.[4] A61M *25/00*
U.S. Cl. 428—36 7 Claims

1. Multilayer medical working means for containing or transporting a physiological material, said medical working means comprising at least two walls laminated together, wherein;

(a) each said wall is made of a glass-clear, soft plastic;

(b) one of said two walls is physiologically unobjectionable and the other said wall is a physiologically questionable wall provided with at least one of a physiologically questionable and untested additive, wherein said physiologically unobjectionable wall is arranged to be directly adjacent a physiological material contained or transported by said medical working means;

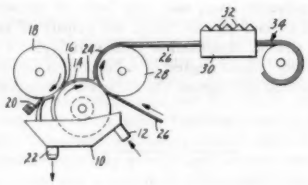
(c) said two walls are adjacent one another and are connected together by a full-area circumferential connection; and

(d) said physiologically unobjectionable wall has a higher content of resin softening material than said physiologically questionable wall, causing a softener gradient to be present between said two walls, the position of said additive in said physiologically questionable wall being kept constant in the said physiologically questionable wall against the pressure of the softener gradient.

4,557,960
PRESSURE SENSITIVE ADHESIVE TRANSFER TAPE CONTAINING ORGANIC FILAMENTS

Caroline L. Vernon, Stillwater, and Earl A. Stanek, St. Croix Beach, both of Minn., assignors to Minnesota Mining and Manufacturing Co., St. Paul, Minn.

Filed Dec. 7, 1983, Ser. No. 558,818
Int. Cl.[4] C08F *2/50*; C09J *7/02*
U.S. Cl. 428—40 7 Claims



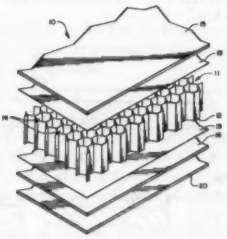
1. Pressure-sensitive adhesive transfer tape comprising an adhesive layer which (1) is a polymer of 50–100 parts alkyl acrylate having an average of 4–12 carbon atoms in its alkyl group and correspondingly 50–0 parts of copolymerizable monoethylenically-unsaturated monomer and (2) contains organic monofilaments which randomly cross each other and are uniformly dispersed in a free extended state, wherein the improvement comprises:

the adhesive contains a photoinitiator and the monofilaments have a randomly disposed, individually arcuate configuration, comprise from 0.1 to 5 percent by volume of the adhesive tape, have an average diameter from 5 to 40 micrometers, and have an average length from 3 to 30 mm, whereby said tape is readily dispensable, said adhesive layer being rubbery and difficult to dispense in the absence of said monofilaments.

4,557,961
LIGHT-WEIGHT, FIRE-RETARDANT STRUCTURAL PANEL

Friedrich J. Gorges, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

PCT No. PCT/US83/00837, § 371 Date May 27, 1983, § 102(e) Date May 27, 1983, PCT Pub. No. WO84/04727, PCT Pub. Date Dec. 6, 1984
PCT Filed May 27, 1983, Ser. No. 514,987
Int. Cl.[4] B32B *3/12*
U.S. Cl. 428—117 33 Claims



1. A composite, lightweight, fire-retardant structural panel element comprising, in combination:

(a) a sheet-like lightweight fire-retardant honeycomb core;

(b) means defining a pair of upper and lower imperforate face sheets formed of lightweight fire-retardant fibrous material impregnated with phenolic resin;

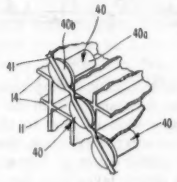
(c) a pair of upper and lower phenolic adhesive films interposed between respective ones of said upper and lower face sheet defining means and said core for adhesively bonding said face sheet defining means to opposite sides of said core; and,

(d) a fire-retardant coating applied to at least the exposed surface of said lower imperforate face sheet defining means, said coating comprising a copolymer of vinylidene fluoride and hexafluoropropene.

4,557,962
MASKING APPARATUS FOR SELECTIVELY CHARGING HONEYCOMB STRUCTURES

James A. Belmonte, Corning, and Arthur E. Hillman, Campbell, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Division of Ser. No. 295,610, Aug. 24, 1981, Pat. No. 4,427,728. This application Sep. 23, 1983, Ser. No. 535,240
Int. Cl.[4] B32B *3/12*
U.S. Cl. 428—117 2 Claims



1. The combination comprising:

a honeycomb structure having a pair of opposing open end faces and a matrix of thin walls defining a multiplicity of hollow, open ended cells extending through said structure between said pair of end faces, including a selected subset of said cells, and

a plurality of preformed plugs for use in bulk charging a

flowable material into said selected subset of cells, each of said preformed plugs removably inserted into and temporarily substantially blocking, at an end face, an open end of each of said cells not in said subset.

4,557,963

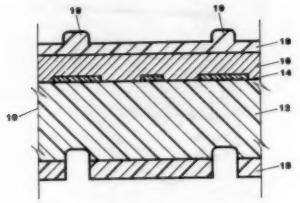
TAMPER-RESISTANT POLYESTER CREDIT CARDS

R. Scott Caines, Greer, S.C., assignor to American Hoechst Corporation, Somerville, N.J.

Division of Ser. No. 482,089, Apr. 4, 1983, Pat. No. 4,522,670. This application Dec. 5, 1984, Ser. No. 678,535

Int. Cl.[4] B32B *3/00, 1/00;* **C09J** *5/00;* **B41M** *3/14*

U.S. Cl. 428—156 **2 Claims**



2. A credit card blank produced according to a method of preparing a credit or identification card comprising: (a) providing a supply of substantially amorphous polyester sheet material; (b) providing a supply of overlay film; (c) laminating said overlay film to one or both sides of said sheet material under heat and pressure insufficient to substantially crystallize said amorphous polyester sheet to provide a composite sheet; (d) embossing a portion of a surface of said composite sheet under pressure with numerical and/or letter characters; (e) holding said composite sheet under restraint while heating said composite sheet to a temperature and for a time sufficient to substantially crystallize at least the embossed portion of said amorphous polyester sheet; and (f) cooling said sheet material.

4,557,964

HEAT TRANSFERABLE LAMINATE

Frank A. Magnotta, Framingham, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.

Continuation-in-part of Ser. No. 501,454, Jun. 6, 1983, abandoned. This application Jun. 29, 1984, Ser. No. 626,253

Int. Cl.[4] B32B *1/00*

U.S. Cl. 428—187 **9 Claims**

1. A heat transferable laminate comprising a substrate affixed to a support member for transfer from the support member to an article upon application of heat to the support member while said article contacts the substrate, the substrate comprising in sequence a release layer in contact with the support member and an ink design layer over the release layer, and the release layer comprising:

a paraffin wax comprising linear saturated C_{18} to C_{32} hydrocarbons having a melting point between about 110° F. and 150° F.,

a montan wax being oxidized, esterified, and partially saponified, and

a thermoplastic tackifying polymer comprising a transparent, nonwax hydrogenated hydrocarbon polymer being the product of a cyclic hydrocarbon monomer polymerized and subsequently fully hydrogenated after said polymerization, said tackifying polymer having a softening point between about 60° C. and 135° C., which tackifying polymer resists oxidation under ambient conditions and has a Color Gardner No. of between about 1 and 4, the resistance to oxidation preventing dulling of the release layer and design layer after the substrate comprising said release layer and design layer has been transferred to an article.

4,557,965

CAMOUFLAGE CONTROLLING REFLECTION OF BOTH LONG AND SHORT RADAR WAVES

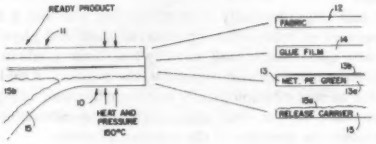
Lars Karlsson, Gamleby, Sweden, assignor to Diab-Barracuda AB, Laholm, Sweden

Filed Apr. 5, 1984, Ser. No. 597,163

Claims priority, application Sweden, Apr. 7, 1983, 8301908

Int. Cl.[4] B32B *5/12*

U.S. Cl. 428—196 **18 Claims**



1. Camouflage material comprising a laminate including a supporting layer therein substantially coextensive with said camouflage material, a polymer layer disposed at the ultimately exteriorly exposed side of said camouflage material, said polymer layer having a matte outer surface, and embodying means for reflecting incident radar waves throughout the radar electromagnetic spectrum to a predetermined extent with respect to the respective wavelength ranges within said spectrum, said means comprising electrically conductive fibrils arranged within said means for reflecting radar waves and distributed throughout an area substantially coextensive with said supporting layer and supported thereby and a thin layer of cracked metal substantially coextensive with and supported upon said polymer layer, said thin layer of crackled metal being glued to said support layer, the density of said fibrils being such that in combination with said layer of crackled metal a predetermined degree of reflection of incident radar waves is attained throughout the radar electromagnetic spectrum.

4,557,966

FERROUS METAL CORROSION INHIBITING SHEET MATERIAL

David M. Weil, Chicago, Ill., assignor to The Cromwell Paper Company, Chicago, Ill.

Filed Apr. 6, 1984, Ser. No. 597,711

Int. Cl.[4] B32B *3/14, 5/16*

U.S. Cl. 428—209 **4 Claims**

1. In an article for inhibiting corrosion of ferrous metal surfaces, a sheet carrier over-printed with a pattern of uniformly spaced areas of predetermined size formed of a vapor phase corrosion inhibiting composition applied with a printed density such that the dried weight of the said composition contained on each square foot of the printed area of the carrier is within the range of 0.2268 to 0.302 grams and the pattern of uniformly spaced inhibitor printed area occupies about 25 to 30 percent of each square foot of the printed carrier.

4,557,967

ADHESIVE-COATED MULTIFILAMENT YARN OF AN AROMATIC POLYAMIDE, A YARN PACKAGE, A CORD, A FABRIC, A REINFORCED OBJECT AND A PROCESS FOR MAKING SAID YARN

Stephanus Willemsen, Rheden; Willem E. Weening, Zevenaar, and Anne Steenbergen, Westervoort, all of Netherlands, assignors to Akzo N.V., Arnhem, Netherlands

Filed Nov. 1, 1983, Ser. No. 547,491

Claims priority, application Netherlands, Nov. 2, 1982, 8204243

Int. Cl.[4] D03D *3/00*

U.S. Cl. 428—224 15 Claims

1. A multifilament yarn which consists of an aromatic polyamide and is provided with an adhesive coating of a cured epoxy compound, characterized in that the yarn has a free epoxide content not higher than 10 mmoles/kg, the epoxide compound having been applied to the yarn and cured while the yarn has a twist of fewer than 10 turns per meter.

4,557,968

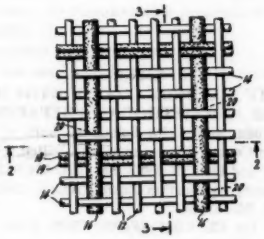
DIRECTIONAL ELECTROSTATIC DISSIPATING FABRIC AND METHOD

Peter B. Thornton, Bronxville; Stanley H. Cone, and George W. Booz, both of Hornell, all of N.Y., assignors to Stern & Stern Textiles, Inc., Hornell, N.Y.

Continuation-in-part of Ser. No. 517,124, Jul. 25, 1983. This application Sep. 10, 1984, Ser. No. 648,765

Int. Cl.[4] D03D *3/00*

U.S. Cl. 428—229 19 Claims



1. An improved static dissipating fabric comprising a base fabric constructed of base fabric yarn having a front surface and a back surface, a first plurality of electroconductive yarns constructed into said base fabric extending from said front surface to said back surface of said base fabric and extending substantially beyond the plane of said back surface in a substantially mutually parallel orientation to each other thereby forming a raised substantially parallel grid on said back surface of said base fabric and a smooth or substantially smooth grid on said front surface.

4,557,969

SHEET-LIKE PACKING MATERIAL OF MELAMINE OR PHENOL RESIN FIBERS

Heinz Berbner, Moerlenbach; Bernhard Seid, Frankenthal; Heinz Voelker, Limburgerhof, and Hans D. Zettler, Gruenstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 19, 1984, Ser. No. 672,636

Claims priority, application Fed. Rep. of Germany, Nov. 17, 1983, 3341461

Int. Cl.[4] D04H *1/58*

U.S. Cl. 428—283 6 Claims

1. A sheet-like packing material which consists of

A. from 2 to 90% by weight of plastic fibers and/or plastic fibrids,

B. from 5 to 90% by weight of finely divided inorganic fillers,

C. from 2 to 40% by weight of organic binders and

D. from 0.1 to 50% by weight of thermoplastic fibrids,

the percentages summing to 100 and which has

(a) a gas permeability according to DIN 3535 of less than 1.0 cm^3/min,

(b) a compressive creep strength according to DIN 52,913 which is greater than 10N/mm^2,

(c) a compressibility according to ASTM F36 of from 3 to 25%,

(d) a resilience according to ASTM F36 of from 30 to 80% and

(e) swelling according to ASTM F146 of less than 15%,

wherein the plastic fibers or plastic fibrids consist of a melamine resin or of a phenol resin.

4,557,970

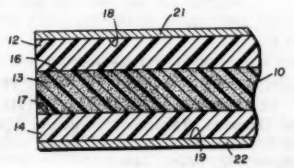
LAMINATE STRUCTURE WITH IMPROVED ACOUSTICAL ABSORPTION

James S. Holtrop, South Windsor, Conn., and Richard P. Maurer, Wilbraham, Mass., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 553,594, Nov. 21, 1983, Pat. No. 4,476,183. This application Sep. 4, 1984, Ser. No. 647,311

Int. Cl.[4] B32B *5/32, 7/12*

U.S. Cl. 428—316.6 4 Claims



1. A laminate structure with improved acoustical absorption consisting of:

first and third layers of foamed polystyrene, each of said first and third layers having an inner surface and an outer surface, wherein a sheet of paper is adhesively bonded to at least the outer surfaces of said first and third layers of foamed polystyrene; and

a second layer of foamed polyurethane, said second layer being intermediate said first and third layers, wherein a portion of said second layer being bonded to said inner surface of said first and third layers of thermoplastic material.

4,557,971

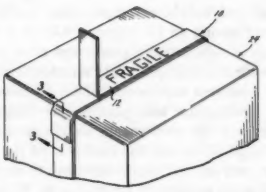
MULTIPLE LAYERED MARKABLE AND SELF-ADHEREABLE TAPE

Robert Williams, 9104 Rott Rd., St. Louis, Mo. 63127

Filed May 18, 1984, Ser. No. 612,030

Int. Cl.[4] C09J *7/02;* B32B *27/10*

U.S. Cl. 428—343 11 Claims



1. In an improved multiple layered tape; a non-adhereable

plastic, strength layer of the tape not suited for the adherence to it of water-soluble glue, a carrier layer united on one side of the non-adhereable layer and capable of holding a water-soluble adhesive and a water-soluble adhesive film, suitable for adherence to cartons and the like, on the side of the carrier layer opposite the non-adhereable layer, a permeable layer united to the surface of the non-adhereable layer on the side opposite the carrier layer, said permeable layer being a surface suitable to be written or printed upon and said permeable layer capable of being adhered to by the water-soluble adhesive film.

4,557,972

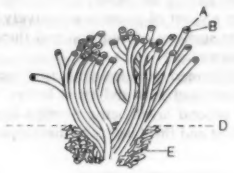
ULTRAFINE SHEATH-CORE COMPOSITE FIBERS AND COMPOSITE SHEETS MADE THEREOF

Miyoshi Okamoto, Takatsuki; Hiromichi Iijima, Otsu, and Akito Miyoshi, Kusatsu, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Continuation of Ser. No. 347,623, Feb. 10, 1982, abandoned, which is a continuation-in-part of Ser. No. 338,978, Jan. 12, 1982, abandoned. This application Dec. 6, 1984, Ser. No. 678,386

Int. Cl.⁴ D02G *3/00*; B29F *3/10*

U.S. Cl. 428—373 **4 Claims**



1. A bundle which is substantially composed of a polyester type sheath-core ultrafine composite fiber wherein (a) the fineness is 0.5 to 0.0001 denier, (b) the core component is located substantially at the center of the sheath component, (c) the core component is substantially composed of a polyester selected from the group consisting of polyethylene terephthalate (referred to as PET hereinafter) having an IV value of 0.75 to 1.2 and polybutylene terephthalate (referred to as PBT hereinafter) having an IV value of 0.85 to 2.5 and the sheath component is substantially composed of a polyester copolymerized with a sulfoisophthalate selected from the group consisting of 5-sodium sulfoisophthalate, 5-lithium sulfoisophthalate and 5-potassium sulfoisophthalate (referred to as 5-SS hereinafter), (d) the core/sheath weight ratio is in the range of from 10/90 to 70/30 and the thickness of the sheath is 0.04 to 2 microns, and (e) the 5-sulfoisophthalate component is copolymerized in an amount of 1.5 to 8 mole % based on the total acid components.

4,557,973

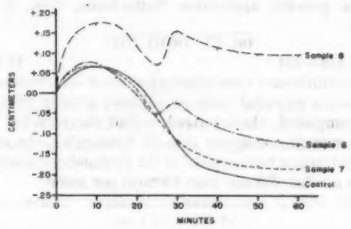
FIRE RESISTANT GYPSUM BOARD CONTAINING MINERAL WOOL FIBERS AND METHOD

Mohammad H. Ali, Chicago, Ill., assignor to United States Gypsum Company, Chicago, Ill.

Filed Dec. 28, 1983, Ser. No. 566,327

Int. Cl.⁴ B05D *3/12, 7/00*; B32B *5/16, 9/00*

U.S. Cl. 428—404 **27 Claims**



16. An article for use in manufacture consisting essentially of an intimate, intersticial mixture of nodules of blown mineral wool fibers coated with powdered calcium sulfate solids.

4,557,974

GRAPHITE FLUORIDE COATED WITH ORGANIC POLYMER AND METHOD OF PREPARING SAME

Hitoshi Tsukuda, and Akira Sakanoue, both of Ube, Japan, assignors to Central Glass Company Limited, Ube, Japan

Filed Oct. 18, 1982, Ser. No. 434,902

Claims priority, application Japan, Oct. 22, 1981, 56-167963; Oct. 22, 1981, 56-167964

Int. Cl.⁴ C08F *28/900*; C08K *3/04*

U.S. Cl. 428—407 **2 Claims**

1. A modified graphite fluoride consisting essentially of fine particles of graphite fluoride coated with a vinylic polymer which is bonded to the surface of the graphite fluoride particles by graft polymerization,

said graphite fluoride being selected from the group consisting of $(CF)_n$, $(C_2F)_n$, and mixtures thereof,

said vinylic polymer being selected from the group consisting of polyacrylic acid, polymethacrylic acid, polyacrylates, polymethacrylates, polyacrylonitrile, poly-N-methylolacrylamide, polyvinyl chloride, polyvinyl acetate, polystyrene, polyvinyl benzene, polyvinylidene fluoride, and copolymers thereof,

wherein the content of the vinylic polymer in the modified graphite fluoride ranges from at least 0.5% to not more than 50% by weight.

4,557,975

PHOTOCURABLE ACRYLATE-ACRYLONITRILE COATED PLASTIC ARTICLES

James E. Moore, Mt. Vernon, Ind., assignor to General Electric Company, Pittsfield, Mass.

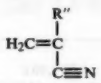
Filed Dec. 30, 1983, Ser. No. 566,977
Int. Cl.[4] B05D *3/06*
U.S. Cl. 428—412 11 Claims

1. A transparent, scratch-resistant, coating composition for application to plastic substrates which coating composition comprises:

(i) an amount of photoinitiator effective to initiate the photocure of said composition upon exposure to ultraviolet light;

(ii) pentaerythritol triacrylate; and

(iii) at least one acrylonitrile of the general formula



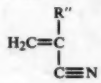
wherein R″ is selected from the group consisting of a hydrogen, halogen, and aliphatic hydrocarbon containing up to 3 carbons, to form a composition having a weight ratio of acrylonitrile to polyfunctional acrylate between about 1/100 to about 5/1.

4. An article having improved abrasion resistance comprising a plastic substrate coated with an ultraviolet light cured coating comprising the photoreaction products of:

(i) a photoinitiator;

(ii) pentaerythritol triacrylate; and

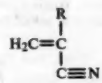
(iii) at least one acrylonitrile of the general formula:



wherein R″ is selected from the group consisting of a hydrogen, halogen, and aliphatic hydrocarbon containing up to 3 carbons, to form a composition having a weight ratio of acrylonitrile to polyfunctional acrylate between about 1/100 to about 5/1.

8. The method for providing a mar resistant, tenaciously and durably adhered, hard coating onto the surface of a plastic substrate comprising the steps of:

(i) coating the plastic substrate with a composition comprising: (a) pentaerythritol triacrylate; (b) a photoinitiator, and (c) acrylonitrile of the general formula



wherein R″ is selected from the group consisting of a hydrogen, halogen, and aliphatic hydrocarbon containing up to 3 carbons in a weight ratio of about 1/100 to about 5/1 to said polyfunctional acrylate monomer; and

(ii) photo-curing the resultant coating, thereby forming said hard coating.

4,557,976

HEAT-HARDENABLE BINDER MIXTURE

Michael Geist, Münster, and Horst Diefenbach, Nottuln, both of Fed. Rep. of Germany, assignors to BASF Farben & Fasern AG, Hamburg, Fed. Rep. of Germany

Filed Aug. 24, 1983, Ser. No. 526,072
Claims priority, application Fed. Rep. of Germany, Sep. 7, 1982, 3233139; Jun. 24, 1983, 3322766
Int. Cl.[4] B05D *3/02;* B32B *15/08, 27/38;* C08L *63/00*
U.S. Cl. 428—413 35 Claims

21. In an article having a coating from a binder mixture deposited thereon, the improvement comprising:

said binder mixture consisting essentially of the following components:

(A) an organic nonacidic resin having a hydroxyl group content of at least 0.2 equivalent in 100 g of resin and having a molecular weight of at least 850; and

(B) a cross-linking agent comprising an organic compound which contains at least two carbalkoxymethyl ester groups per molecule, wherein the proportion of component (A) is 50–95% by weight and that of component (B) is 5–50% by weight, the total weight of components (A) and (B) being 100%.

4,557,977

POLYVINYLIDENE FLUORIDE COATINGS

Timothy I. Memmer, Strongsville, and Peter T. Abel, Berea, both of Ohio, assignors to SCM Corporation, New York, N.Y.

Filed Aug. 29, 1984, Ser. No. 645,279
Int. Cl.[4] B05D *1/36, 7/00;* B32B *27/00;* C08L *61/00*
U.S. Cl. 428—421 8 Claims

1. A solvent-borne composition for application to exterior building product substrate comprising on a resins solids basis:

a. from 10% to 50% of a fluorocarbon resin

b. from 20% to 89% of an acrylic resin

c. from 1% to 30% of a flow modifier; said modifier selected from the group consisting of benzoguanamine resin, a blocked isocyanate or a polymeric urethane and wherein a+b+c total 100 percent.

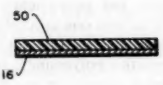
7. A metal substrate coated with the composition of claim 1.

4,557,978

ELECTROACTIVE POLYMERIC THIN FILMS

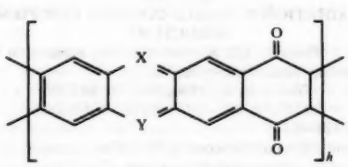
James W. Mason, Huntington Beach, Calif., assignor to Primary Energy Research Corporation, Torrance, Calif.

Filed Dec. 12, 1983, Ser. No. 560,601
Int. Cl.[4] B32B *15/04*
U.S. Cl. 428—457 19 Claims



1. A coated article comprising:

a substrate having at least one surface coated with an integral, homogeneous, continuous film of an in-situ polymerized PAQR polymer containing repeating units selected from:



or

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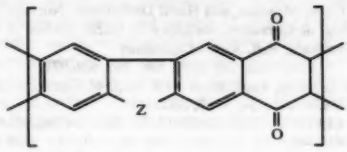


where X is C, CH, C═O, C—N, N, S, O or a carbon-carbon bond, Y is the same or different member selected from X and Z is NH, O, S, CH, C═O, SO or SO_2.

2. An article according to claim 1 in which the substrate is a metal.

4,557,979

PROCESS FOR DEPOSITION OF RESIN DISPERSIONS ON METAL SUBSTRATES

Harold P. Higginbottom, Wilbraham, and Manuel F. Drumm, Springfield, both of Mass., assignors to Monsanto Company, St. Louis, Mo.

Filed Feb. 17, 1984, Ser. No. 581,382

Int. Cl.⁴ B32B *15/08*

U.S. Cl. 428—460 **31 Claims**

1. A process for the deposition of a film of a blend of a poly(3,4-dihydro-3-substituted-1,3-benzoxazine) and a reactive polyamine on a metal substrate which comprises forming a dispersion of the polydihydrobenzoxazine and the reactive polyamine in an aqueous medium containing a protonating acid, forming an electrolytic cell using the metal substrate as the cathode of the cell and the aqueous dispersion as the electrolyte, and subjecting the aqueous dispersion to electrophoresis whereby to deposit the blend of the polydihydrobenzoxazine and the reactive polyamine on the metal substrate as an adherent film, wherein the poly(dihydrobenzoxazine) is of number average molecular weight in the range of about 250 to about 2000, with the majority of the individual molecules containing at least two dihydrobenzoxazine groups, and is the reaction product of about 1 equivalent of a primary amine selected from the group consisting of mono- and poly-primary amines, about 1 equivalent of a phenol selected from the group consisting of mono- and poly-phenols having phenolic hydroxy groups with at least one unsubstituted position ortho to such hydroxy groups and about 2 equivalents of formaldehyde, and wherein the reactive polyamine is at least difunctional, the reactive groups being primary or secondary amine.

4,557,980

RADIATION CURABLE COATING FOR FILM STRUCTURE

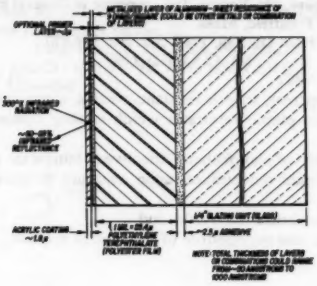
William P. Hodnett, III, Martinsville, Va., assignor to Martin Processing, Inc., Martinville, Va.

Filed Aug. 21, 1984, Ser. No. 642,795

Int. Cl.⁴ B32B *15/04, 15/08;* **B05D** *3/06*

U.S. Cl. 428—336 **29 Claims**

1. A radiation curable coating for a film structure, comprising a coating composition of a mixture of radiation polymerizable monomers comprising a triacrylate or tetraacrylate monomer and acrylic acid, said coating adhered to a substrate, the thickness of said coating after polymerization ranging between about 1 and about 2.5 microns, whereby an abrasion resistant



coating having substantially reduced infrared absorption is obtained.

4,557,981

ARTICLE COMPRISING A SUBSTRATE HAVING A HARD AND CORROSION-PROOF COATING THEREON

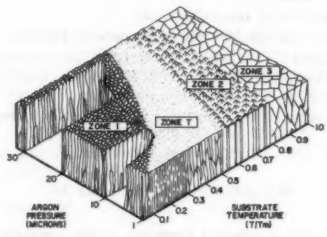
Erich Bergmann, Fläsch, Switzerland, assignor to ETA S.A., Fabriques d'Ebauches, Granges, Switzerland

Filed Feb. 9, 1984, Ser. No. 578,637

Claims priority, application Switzerland, Feb. 17, 1983, 879/83

Int. Cl.⁴ C23C *15/00*

U.S. Cl. 428—627 **12 Claims**



1. An article comprising a metallic substrate and a metallic coating applied to said substrate by plasma assisted deposition of an alloy composition containing 2%–3% carbon, 40%–55% cobalt, 25%–35% chromium and 10%–20% tungsten, said coating having ultrafine fragments of at least one of chromium carbide and tungsten carbide distributed in an alloy matrix and a compact structure provided by carrying out said plasma assisted deposition at an inert gas pressure and a substrate temperature defined by a point in zone T of FIG. 6.

4,557,982

MAGNETIC RECORDING FLEXIBLE DISC

Hiroshi Nouda, Sagamihara; Kinji Hasegawa, Yokohama, and Masahiro Hosoi, Sagamihara, all of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Apr. 6, 1984, Ser. No. 597,692

Claims priority, application Japan, Apr. 7, 1983, 58-60041; Sep. 27, 1983, 58-176968

Int. Cl.⁴ G11B *5/62, 5/82*

U.S. Cl. 428—694 **2 Claims**

1. A magnetic recording flexible disc composed of a polyester film substrate having formed thereon a magnetic layer, the improvement wherein said polyester film is a biaxially oriented film stretched in a longitudinal direction at a stretch ratio of 3.3

to 4.3 and stretched in a transverse direction at a stretch ratio of between 3.4 to 4.5, and consisting of poly 1,4-cyclo-hexylene dimethylene terephthalate wherein at least 90 mole % of a glycol component is 1,4-cyclohexane-dimethanol and at least 80 mole % of an acid component is terephthalic acid, a maximum value of a temperature dependent expansion in the surface direction of the film is 9×10^{-6} to 35×10^{-6}/°C., a maximum value of a humidity dependent expansion in the surface direction of the film is 0 to 8.0×10^{-6}/% RH, the difference between the maximum and minimum values of the temperature dependent expansion in the surface direction of the film is 0 to 8.0×10^{-6}/°C., and the difference between the maximum and minimum values of the humidity dependent expansion in the surface direction of the film is 0 to 3.0×10^{-6}/% RH.

4,557,983

AIR/OXYGEN CELL

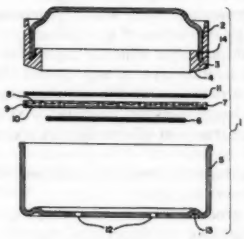
Hans Sauer, Idstein, Fed. Rep. of Germany, assignor to Varta Batterie Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Apr. 20, 1984, Ser. No. 602,593

Claims priority, application Fed. Rep. of Germany, Apr. 22, 1983, 3314624

Int. Cl.⁴ H01M *2/02, 12/06*

U.S. Cl. 429—27 **14 Claims**



1. In an air/oxygen cell comprising an inner metal cup for receiving electrolyte and negative electorde material and an outer metal cup for receiving a multilayer positive electrode, said cups being joined with interposition of an insulating seal, the improvement comprising:

an inwardly extending rib shaped in the bottom of the outer metal cup, wherein said rib is spaced from the periphery of the bottom of the outer metal cup, and wherein said rib is positioned so that said multilayer positive electrode is firmly clamped between the rib and the seal.

4,557,984

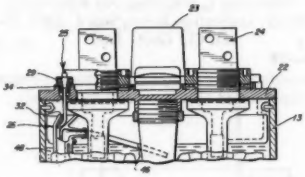
ADAPTER GUIDE FOR AIR SUPPLY TUBE

Ralph V. Offidani, Willingboro, N.J., assignor to GNB Batteries Inc., Mendota Heights, Minn.

Filed Dec. 31, 1984, Ser. No. 688,091

Int. Cl.⁴ H01M *2/38*

U.S. Cl. 429—67 **20 Claims**



1. In a battery having a liquid electrolyte and plates immersed in the electrolyte within an outer case, the improvement comprising:

an air lift pump barrel assembly within the case having guide means defining a tapered inlet portion having an outer end and an inner smaller cross section portion;

means in said case defining an opening aligned with said inlet outer end; and

an air supply tube extending through said case opening and outer end of the inlet portion and having an inner portion removably received in said guide means inner portion thereof as an incident of said tube inner end being inserted through said case opening and inlet outer end, said tapered inlet configuration defining means for effectively guiding the distal inner end of the tube accurately into said smaller inner portion of the guide means as an incident of insertion thereof through said case opening into said guide means.

4,557,985

POLYACETYLENE CELL WITH CERAMIC SOLID ELECTROLYTE

Ernst Voss, Hanover, Fed. Rep. of Germany, assignor to Varta Batterie Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Jan. 13, 1983, Ser. No. 457,662

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1982, 3201909

Int. Cl.⁴ H01M *6/18*

U.S. Cl. 429—191 **9 Claims**

1. In a galvanic element having a solid positive electrode, a solid negative electrode and a solid electrolyte, the improvement wherein:

said solid electrolyte is a ceramic solid body; and

at least one of said electrodes is comprised of polyacetylene directly polymerized onto the ceramic solid body.

4,557,986

HIGH RESOLUTION LITHOGRAPHIC PROCESS

Phillip D. Blais, Washington Township, Fayette County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 459,286, Jan. 29, 1983, Pat. No. 4,454,209. This application Apr. 10, 1983, Ser. No. 598,761

Int. Cl.⁴ G03F *9/00, 1/00, 7/26*

U.S. Cl. 430—22 **1 Claim**

1. A method for photolithographic processing of semiconductor wafer comprising the steps of:

(a) positioning a first mask having a metallic central portion and a glass edge portion in overlying relationship with a semiconductor wafer covered with a resist layer;

(b) directing a flood beam of radiation of a first wavelength shorter than visible light to impinge on said mask to selectively expose said resist in an area underlying said metallic portion;

(c) developing said resist to form a first portection layer to delineate first areas of the surface to be exposed during the first processing steps of a semiconductor circuit and areas to form optical alignment keys to be used to align subsequent mask for subsequent photolithographic processing steps;

(d) processing said semiconductor wafer to modify said first areas in accordance with the processing requirements determined by the specifications of the device being manufactured and said second areas to form keys suitable for optical alignment of mask used in subsequent processing steps;

(e) coating said semiconductor wafer with a second layer of resist;

(f) positioning a second mask in overlying relationship with said second resist layer, said second mask having:

(1) a glass support frame transparent to visible light and non-transparent to short wavelength radiation,

(2) a beryllium foil non-transparent to visible light and transparent to said short wavelength radiation, said foil being affixed to said support frame such that said support frame extends beyond the perimeter of said foil with said foil and said portions of said support frame

which extend beyond the perimeter of said foil joining to form a substantially flat surface, and

(3) a thin patterned layer affixed to said substantially flat surface rendering portions of said beryllium foil and said support frame overlaid by said patterned layer non-transparent to visible light and to radiation within said selected band with portions of said support frame in conjuction with portions of said patterned layer forming a key for aligning said mask permitting said mask to be aligned using visible light;

(g) Optically aligning said second mask with said keys using radiation within the visible spectrum and corresponding keys in said glass portion of said second mask;

(h) directing a flood beam of radiation of said first wavelength to impinge on said second mask to selectively expose said resist layer;

(i) developing said resist to form protective layers delineating areas of said semiconductor wafer to be modified during the next processing steps;

(j) processing the semiconductor wafer to modify the delineated areas.

4,557,987

PHOTOCONDUCTIVE MEMBER HAVING BARRIER LAYER AND AMORPHOUS SILICON CHARGE GENERATION AND CHARGE TRANSPORT LAYERS

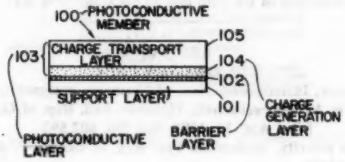
Shigeru Shirai, Yamato; Junichiro Kanbe, Yokohama, and Tadaji Fukuda, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 8, 1981, Ser. No. 328,499

Claims priority, application Japan, Dec. 23, 1980, 55-183130; Dec. 23, 1980, 55-183131

Int. Cl.[4] G03G *5/082;* H01L *45/00*

U.S. Cl. 430—58 **79 Claims**



1. A photoconductive member, comprising a support for a photoconductive member;

a charge generation layer which generates photocarriers movable by irradiation of an electromagnetic wave;

a charge transport layer which is disposed in relation to said charge generation layer so as to permit efficient injection of photocarriers generated in said charge generation layer into the charge transport layer and is provided with the function to transport effectively said injected photocarriers; and

a first barrier layer interposed between said support and said charge generation layer;

said charge generation layer and said charge transport layer each comprising an amorphous material containing at least one of hydrogen and halogen atoms in a matrix of silicon atoms, and said charge generation layer containing at least one of a donor and acceptor impurity to control the conduction of said charge generation layer, said impurity present in an amount of 1×10^{-1} to 10 atomic %, wherein said member is subject to generation of free carriers.

4,557,988

DISAZO COMPOUNDS, PHOTOCONDUCTIVE COMPOSITIONS AND ELECTROPHOTOGRAPHIC LIGHT-SENSITIVE MATERIALS CONTAINING THE SAME

Seiji Horie; Kouichi Kawamura; Naonori Makino, and Hideo Sato, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

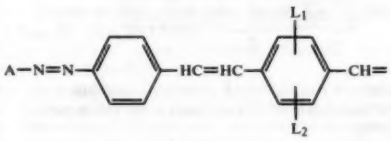
Filed Sep. 1, 1983, Ser. No. 528,704

Claims priority, application Japan, Sep. 1, 1982, 57-152091

Int. Cl.[4] G03G *5/06*

U.S. Cl. 430—58 **9 Claims**

1. Photoconductive compositions which contain disazo compounds represented by the general formula (I):



(I)

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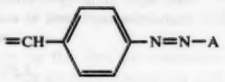
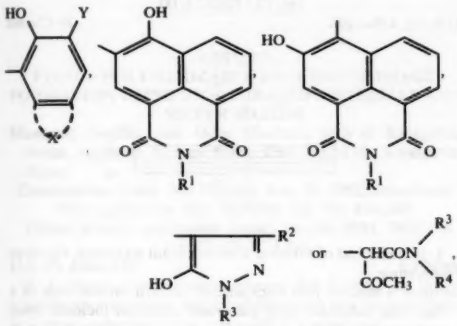
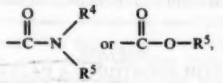


wherein L_1 and L_2 each represents a hydrogen atom, a halogen atom, a cyano group or a methylthio group, but L_1 and L_2 do not represent hydrogen atoms together, though they may represent identical or different groups, and A represents



wherein X represents an atomic group necessary to form an aromatic or heterocyclic ring (which may be substituted or nonsubstituted) by condensing with the benzene ring in the above described formula to which a hydroxyl group and Y are attached, Y represents



R^1 represents an alkyl group, a phenyl group or a substituted alkyl or phenyl group, R^2 represents a hydrogen atom, a lower alkyl group, a carbamoyl group, a carboxyl group, an alkoxycarbonyl group, an aryloxycarbonyl group or a substituted or nonsubstituted amino group, R^3 and R^5 each represents an alkyl group, an aromatic group, a heteroaromatic group or a substituted alkyl, aromatic or heteroaromatic group, and R^4 represents a hydrogen atom, an alkyl group, a phenyl group or a substituted alkyl or phenyl group.

4,557,989

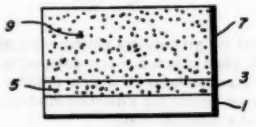
PHOTORESPONSIVE IMAGING MEMBERS WITH DIHYDROXY METAL PHTHALOCYANINE COMPOSITIONS

Randolph E. Branston, and James M. Duff, both of Mississauga, Canada, assignors to Xerox Corporation, Stamford, Conn.

Filed Sep. 13, 1984, Ser. No. 650,381

Int. Cl.[4] G03G *5/06, 5/14*

U.S. Cl. 430—59 **11 Claims**



1. An improved layered photoresponsive imaging member comprised of (1) a supporting substrate, (2) a photogenerating layer comprised of a dihydroxymetallic phthalocyanine pigment selected from the group consisting of dihydroxygermanium phthalocyanine, dihydroxytin phthalocyanine and dihydroxysilicon phthalocyanine, and (3) a diamine hole transport layer comprised of an arylamine dispersed in an inactive resinous binder composition.

4,557,990

HYDROGENATED AMORPHOUS SILICON PHOTOSENSITIVE MEMBER FOR ELECTROPHOTOGRAPHY

Katsumi Nakagawa, Tokyo; Toshiyuki Komatsu, Kawasaki; Yutaka Hirai, Tokyo; Teruo Misumi, Toride, and Tadaji Fukuda, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 269,846, Jun. 3, 1981, Pat. No. 4,461,819, which is a continuation of Ser. No. 16,986, Mar. 2, 1979, abandoned. This application Dec. 23, 1983, Ser. No. 565,191

Claims priority, application Japan, Mar. 3, 1978, 53-24628; Mar. 14, 1978, 53-29030; Apr. 28, 1978, 53-51851

The portion of the term of this patent subsequent to May 5, 1998, has been disclaimed.

Int. Cl.[4] G03G *5/082*

U.S. Cl. 430—84 **6 Claims**

1. An image-forming member for electrophotography comprising a substrate for electrophotography and a charge generation layer being formed of amorphous silicon and containing 1–40 atomic percent of hydrogen.

4,557,991

TONER FOR DEVELOPMENT OF ELECTROSTATIC IMAGE CONTAINING BINDER RESIN AND WAX

Hiroyuki Takagiwa; Jiro Takahashi; Meizo Shirose; Naomi Inaba, and Megumi Seki, all of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Mar. 12, 1984, Ser. No. 588,802

Claims priority, application Japan, Mar. 25, 1983, 58-48703; Mar. 25, 1983, 58-48704; Mar. 25, 1983, 58-48705; Mar. 25, 1983, 58-48706; Jun. 17, 1983, 58-107930

Int. Cl.[4] G03G *9/08, 9/14*

U.S. Cl. 430—109 **35 Claims**

1. A toner particle for development of electrostatic images, characterized by including

(1) a binder resin selected from the group consisting of

a polyester resin containing 5% by weight or more of its chloroform-insoluble content;

a polymer of a vinyl monomer containing 0.005% by weight or more of a cross-linking agent monomer with respect to the total monomers;

a styrene-butadiene copolymer containing 10% by weight or more of a high molecular weight component having a molecular weight of 100,000 or more;

a polymer of a styrene monomer or a copolymer of the styrene monomer and another vinyl monomer, a ratio of its weight average molecular weight Mw with respect to its number average molecular weight Mn being 3.5 or more; and

a polymer formed by polymerization of a polymerizable monomer in the presence of a reactive prepolymer;

(2) a wax comprising a polyolefin which has been block copolymerized or graft copolymerized with an aromatic vinyl monomer wherein the content of said wax is within the range of 1 to 20% by weight; and (3) a colorant.

4,557,992

DEVELOPING METHOD

Satoshi Haneda, and Seiichiro Hiratsuka, both of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Mar. 26, 1984, Ser. No. 593,352

Int. Cl.[4] G03G *15/09*

U.S. Cl. 430—122 **17 Claims**

1. A developing method comprising the steps of supplying a

developer having magnetic carrier particles and toner particles on a developer feeding carrier to form a developer layer, the average particle size of the carrier particles being from 5 to 50 μm, and the average particle size of the toner particles being up to 20 μm,

conveying the developer layer into an oscillating electric field, and

developing a latent image on an image retainer by the developer inside the oscillating electric field, the thickness of said developer layer being smaller than the distance between the developer feeding carrier and the image retainer.

4,557,993

PROCESS FOR PREPARING AN ELECTROPHOTOGRAPHIC IMAGING MEMBER WITH NIO INTERLAYER

David J. Matyjakowski, Ontario, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Aug. 3, 1984, Ser. No. 637,621
Int. Cl.[4] G03G *5/082, 5/14*
U.S. Cl. 430—131 **12 Claims**

1. A process for preparing an electrophotographic imaging member comprising providing a nickel substrate resistant to shattering at temperatures of at least about 260° C., heating said nickel substrate to a temperature of at least about 260° C. in the presence of oxygen until a continuous layer of nickel oxide having a thickness of at least about 400 Angstrom units forms on said substrate and depositing at least one photoconductive layer selected from the group consisting of amorphous selenium, selenium alloys and mixtures thereof on said nickel oxide layer.

4,557,994

LIGHT-SENSITIVE PRINTING PLATE WITH PATTERNED MATTING LAYER

Teruo Nagano, Kanagawa; Eiji Nakakita, and Toshiyuki Sekiya, both of Shizuoka, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 484,817, Apr. 14, 1984, abandoned.
This application Sep. 13, 1984, Ser. No. 649,964
Claims priority, application Japan, Apr. 20, 1982, 57-66966
Int. Cl.[4] G03C *1/52*
U.S. Cl. 430—162 **8 Claims**

1. In a light-sensitive, presensitized printing plate comprising:

a support base;

a lithographically suitable light-sensitive layer provided on at least one surface of said support base, said light-sensitive layer comprising a diazo light-sensitive layer; and

a matting layer consisting essentially of a pattern of coated portions and non-coated portions on said light-sensitive layer;

the improvement which comprises said coating portions being in the form of a regular or random micropattern resistant against rubbing or pressure formed of a terpolymer having an average molecular weight of 2,000–200,000 comprised of:

at least one monomer (unit a) selected from the group consisting of p-styrenesulfonic acid, 2-acrylamido-2-methypropanesulfonic acid, ethylenesulfonic acid, and alkali metal salts, ammonium salts, and water-soluble amine salts thereof;

at least one monomer (unit b) selected from the group consisting of alkyl acrylates having 1 to 10 carbon atoms in the alkyl moiety thereof and alkyl methacrylates having 4 to 10 carbon atoms in the alkyl moiety thereof; and

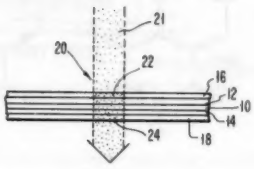
at least one monomer (unit c) copolymerizable with said monomer (unit a) and monomer (unit b), wherein said monomer (unit c) as a homopolymer has a glass transition point of 60° C. or more, wherein said terpolymer is comprised of amounts of monomer (unit a), monomer (unit b) and monomer (unit c) in the range of from 5–50 mole %, 10–70 mole % and 20–80 mole %, respectively, wherein monomer (unit c) is selected from monomer units other than monomer (unit a) and monomer (unit b).

4,557,995

METHOD OF MAKING SUBMICRON CIRCUIT STRUCTURES

Alec N. Broers, Purdys, and Robert B. Laibowitz, Peekskill, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 16, 1981, Ser. No. 311,831
Int. Cl.[4] G03C *5/00*
U.S. Cl. 430—296 **29 Claims**



1. In a method of forming a microcircuit structure, the steps comprising:

defining a desired first microcircuit pattern on one side of a thin film substrate with patterned radiation incident upon said one side, and

defining a desired second microcircuit pattern on the opposite side of said thin film substrate with patterned radiation incident also upon said one side but which passes through said thin film substrate to define said second microcircuit pattern on said opposite side,

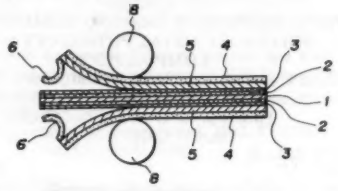
said microcircuit patterns both being defined while said thin film substrate is continuously in one alignment position.

4,557,996

METHOD FOR PROVIDING A PATTERN-WISE PHOTORESIST LAYER ON A SUBSTRATE PLATE AND A SURFACE-PROTECTED SUBSTRATE PLATE THEREFOR

Toshimi Aoyama; Hiroyuki Tohda, both of Fujisawa; Kazuo Kato, Kanagawa, and Hisashi Nakane, Kawasaki, all of Japan, assignors to Photopoly Ohka Co., Ltd., Kanagawa, Japan

Filed May 29, 1984, Ser. No. 614,655
Claims priority, application Japan, Jun. 7, 1983, 58-101329
Int. Cl.[4] G03C *5/44, 1/727*
U.S. Cl. 430—324 **10 Claims**



1. A method for providing a pattern-wise photoresist layer on a substrate plate which comprises the steps of:

(a) forming a first layer of a first positive photosensitive composition containing a halation inhibitor on at least one surface of a substrate plate;

(b) then bonding onto the first layer a preformed dry film of a second positive photosensitive composition;

(c) exposing the film of the second composition with pattern-wise light while simultaneously exposing said first layer to said pattern-wise light, through the second layer; and

(d) dissolving the thus pattern-wise exposed photosensitive film and first layer with a developer liquid capable of dissolving the exposed areas of the first and the second photosensitive compositions,

wherein the halation inhibitor in the first photosensitive composition is an organic dye or pigment compatible with the photosensitive composition and absorbing light in the wavelength range from 280 to 430 nm, and

wherein the amount of halation inhibitor in the first photosensitive composition is in the range from 0.001 to 10% by weight.

4,557,997

PHOTO-POLYMERIZABLE PROCESS OF IMAGE FORMATION USING UNSATURATED MATERIALS AND SILVER HALIDE

Masayuki Iwasaki, and Akira Umehara, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 391,330, Jun. 23, 1982, abandoned. This application May 25, 1984, Ser. No. 614,384

Claims priority, application Japan, Jun. 23, 1981, 56-97258

Int. Cl.⁴ G03C *5/00*

U.S. Cl. 430—325 **5 Claims**

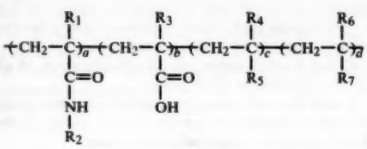
1. A photo-polymerization process for forming an image wherein photosensitive silver halide is used as a photoinitiator in a photo-polymerization composition comprising

(1) 0.1 to 30 parts by weight of silver halide;

(2) 5 to 80 parts by weight of a polymerizable compound having at least two carbon-carbon unsaturated bonds in a molecule thereof; and

(3) 10 to 90 parts by weight of a high molecular binder, said silver halide made by the reaction of silver nitrate with an alkali metal or ammonium halide in a solution comprising said high molecular binder and an organic solvent, said process comprising image-wise exposing said photopolymerizable composition and then removing unexposed unpolymerized areas, wherein the improvement comprises

(A) using as said high molecular binder a copolymer represented by the following formula (I):

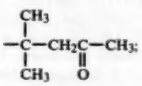


(I)

wherein

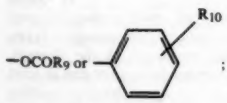
R_1, R_4, R_6 and R_{10} represents H or CH_3;

R_2 represents H, C_{1-8} alkyl or



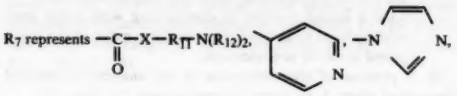
R_3 represents H, CH_3 or CH_2COOH;

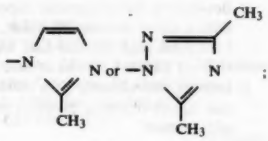
R_5 represents $COOR_8$,



-continued

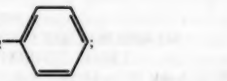
R_7 represents





;

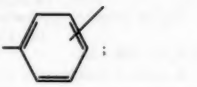
R_8 represents C_{1-8} alkyl or



;

R_9 represents C_{1-3} alkyl;

R_{11} represents



;

R_{12} represents C_{1-8} alkyl;

X represents —O— or —NH—;

a represents 99–10% by mol;

b represents 1–20% by mol;

c represents 0–80% by mol; and

d represents 0–10% by mol,

the copolymer having a molecular weight of about 5,000 to 1,000,000, and the copolymer being soluble in organic solvent and insoluble in water and

(B) developing said image-wise exposed composition to remove unexposed unpolymerized areas by an alkaline aqueous solution or an alkaline aqueous solution containing an organic solvent.

4,557,998

COLORLESS LIGAND-RELEASING MONOMERS AND POLYMERS AND THEIR USE TO PROVIDE DYES WITH METAL IONS

William N. Washburn, Ionia, and Kenneth R. Hollister, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 2, 1985, Ser. No. 688,224

Int. Cl.⁴ G03C *1/40, 7/32*

U.S. Cl. 430—367 **10 Claims**

1. A photographic element comprising a support having thereon at least one silver halide emulsion layer having associated therewith an essentially colorless, hydrophilic ligand-releasing polymer comprising

(a) recurring units derived from an ethylenically unsaturated polymerizable hydrophilic monomer in a number sufficient to render said polymer hydrophilic, and

(b) recurring units derived from an ethylenically unsaturated polymerizable monomer represented by the structure:

wherein

R′ is hydrogen or lower alkyl,

COUP is a photographic color coupling moiety,

LINK is a coupling-off group which can be cleaved from COUP by an oxidized developer composition, and

LIG is a ligand capable of complexing with metal ions, while joined to said polymer, to form a dye in the unexposed areas of said element.

9. A process of dye formation in an imagewise exposed element of claim 1, said process comprising the steps of:

a. developing the imagewise exposed areas of said element with a color developing agent, thereby cleaving LINK-LIG from said polymer and washing substantially all of cleaved LINK-LIG out of said element, and

b. treating said element with metal ions to form a dye with said ligand-releasing polymer in the unexposed areas of said element.

4,557,999

SILVER HALIDE COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Kozo Aoki; Akira Ogawa, and Osami Tanabe, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

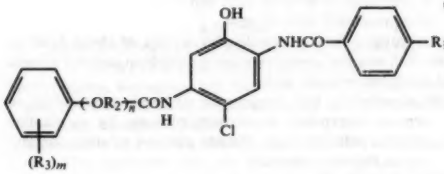
Filed Feb. 9, 1984, Ser. No. 578,350

Claims priority, application Japan, Feb. 9, 1983, 58-20432

Int. Cl.⁴ G03C *7/16*

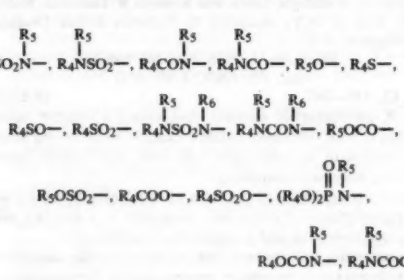
U.S. Cl. 430—385 **18 Claims**

1. A silver halide color photographic light-sensitive material comprising a support having thereon a silver halide emulsion layer, the color photographic light-sensitive material containing a cyan dye forming coupler represented by the following general formula (I):



(I)

wherein R_1 represents a branched chain alkyl group having from 3 to 4 carbon atoms; R_2 represents an alkylene group having from 1 to 21 carbon atoms; R_3 represents a hydrogen atom, a halogen atom, a substituted or unsubstituted alkyl group, a substituted or unsubstituted aryl group,



a nitro group or a cyano group; R_4 represents a substituted or unsubstituted straight chain, branched chain or cyclic alkyl group, a substituted or unsubstituted aryl group or a heterocyclic group; R_5 and R_6 each represents a hydrogen atom, a substituted or unsubstituted straight chain, branched chain or cyclic alkyl group, a substituted or unsubstituted aryl group or a substituted or unsubstituted heterocyclic group; n represents 0 or 1; and m represents an integer of 1 to 5 and when m represents 2 or more R_3s may be the same or different.

4,558,000

COLOR REVERSAL LIGHT-SENSITIVE MATERIAL

Hiroyuki Yamagami; Yasuhiro Hayashi; Naoyasu Deguchi, and Kiyoshi Imai, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

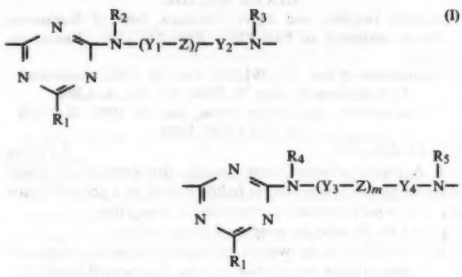
Filed Mar. 16, 1984, Ser. No. 590,398

Claims priority, application Japan, Mar. 16, 1983, 58-43859

Int. Cl.⁴ G03C *1/46*

U.S. Cl. 430—504 **12 Claims**

1. A color reversal light-sensitive material comprising a support having coated thereon at least a pair of silver halide emulsion layers having mutually different color sensitivities and consisting of an emulsion having a high silver/coupler ratio (A) and an emulsion having a low silver/coupler ratio (B), wherein (A)−(B)≧5 and wherein only the latter emulsion contains a compound containing recurring units represented by the following General Formula (I):



(I)

wherein:

R_1 represents —OR, —SR or

in which R and R′ each represents a hydrogen atom, an alkyl, substituted alkyl, aryl, substituted aryl, aralkyl, substituted aralkyl, cycloalkyl, substituted cycloalkyl, heterocyclic or substituted heterocyclic group, or R and R′ in combination form a heterocyclic ring or a heterocyclic ring containing an —O— group;

R_2, R_3, R_4 and R_5 each represents a hydrogen atom, an alkyl group or a substituted alkyl group;

Y_1, Y_2, Y_3 and Y_4 each represents a polymethylene group, a substituted polymethylene group, an aryl group, a substituted aryl group or a cycloalkylene group;

Z represents —O—, —SO_2— or —CH_2—; and

l and m represent 0 or an integer of 1.

4,558,001

SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIALS CONTAINING NONIONIC SURFACE ACTIVE ANTISTATIC AGENT

Shigeki Yokoyama; Hisashi Okamura; Yukio Maekawa, and Hiroshi Kawasaki, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 13, 1984, Ser. No. 599,870

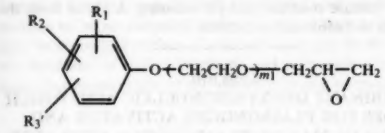
Claims priority, application Japan, Apr. 14, 1983, 58-66007

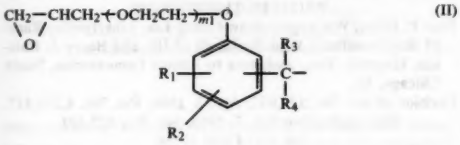
Int. Cl.⁴ G03C *1/32*

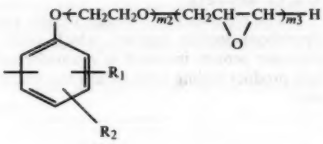
U.S. Cl. 430—527 **10 Claims**

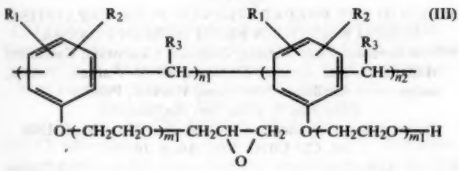
1. A silver halide photographic light-sensitive element comprising a support, and at least one silver halide emulsion layer, and containing gelatin in at least one layer of the element, wherein at least one gelatin containing layer contains at least one antistatic nonionic surface active agent having reactive groups, the agent being incorporated in an amount effective to

prevent static and being represented by the following formula (I), (II) or (III):


(I)


(II)




(III)

wherein R_1, R_2 and R_3' each represents a hydrogen atom or a halogen atom, or an unsubstituted or substituted alkyl, aryl, alkoxy, acyl, amido, sulfonamido, carbamoyl, or sulfamoyl group, R_3 and R_4 each represents a hydrogen atom, an unsubstituted or substituted alkyl or aryl group, or a heteroaromatic ring, R_3 and R_4 may combine to form a ring; m_1 and m_2, which may be the same or different, are 5 to 30, each representing the average degree of polymerization of ethylene oxide, m_3 is 0 or 1; and n_1 and n_2 represent the ratios in the copolymer, and n_1 is 1 to 100 and n_2 is 0 to 99, the sum thereof being 100, wherein said agent represented by the formula (I), (II) or (III) is present in an amount of 5 to 500 mg per m^2 of said photographic light-sensitive material.

4,558,002

PHOTOGRAPHIC PAPER MATERIAL WITH RESIN COATINGS AND PIGMENT MIXTURE

Yasuo Aotsuka, and Soichiro Yamamoto, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 27, 1984, Ser. No. 593,797
Claims priority, application Japan, Mar. 29, 1983, 58-547401
Int. Cl.[4] G03C *1/86*
U.S. Cl. 430—538 **8 Claims**

1. A photographic paper material comprising (1) a support comprised of a paper substrate which is coated on both sides with a synthetic hydrophobic resin film, (2) a hydrophilic colloid layer containing a white pigment provided on one side of the support (1), and (3) a light-sensitive silver halide emulsion layer on the hydrophilic colloid layer (2), wherein a dye or pigment having an absorption within the region of 500 to 800 nm and which is not decolored during photographic processing is present in the hydrophilic colloid layer (2) and/or the synthetic resin film of the support (1), wherein the colloid layer contains not less than 30% by volume of white pigment, and wherein the dye or pigment which is not decolored is present in an amount such that the surface reflection characteristics of the hydrophilic colloid layer containing the white pigment as measured and expressed according to JIS Z 8730 fall within the ranges of L=90 or more, A=0.5 to 1.5 and b=(−3) to (−5).

4,558,003

HARDENING OF POLY(VINYL ACETAL)

Kiyoshi B. Sagawa, Bloomington, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 12, 1984, Ser. No. 588,917
Int. Cl.[4] G03C *1/30*
U.S. Cl. 430—617 **19 Claims**

1. An unexposed photothermographic article comprising a support, a silver containing layer comprising a binder, a silver compound having reducible silver ions, silver halide in catalytic proximity to said silver compound, and a reducing agent for silver ion, said binder comprising at least 25 percent by weight of a poly(vinyl acetal), said article being characterized by the presence of an amount of borate ion, a boric acid salt, or a boric acid, alone or in combination with an isocyanate, sufficient to harden said binder.

4,558,004

MONITORING PRENEOPLASTIC ANTIGEN

Bruce D. Hammock, and Kenji Ota, both of Davis, Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Mar. 25, 1983, Ser. No. 478,962
Int. Cl.[4] C12Q *1/00, 1/34;* **G01N** *33/54*
U.S. Cl. 435—4 **10 Claims**

1. A method for identifying hepatic preneoplastic or neoplastic lesions in a vertebrate, said method comprising:
taking a serum sample from the vertebrate;
assaying said sample to determine the amount of microsomal epoxide hydrolase present therein; and
comparing the determined amount of microsomal epoxide hydrolase with a predetermined level which level is diagnostic of hepatic preneoplastic or neoplastic lesions.

4,558,005

MONOCLONAL ANTI-ERYTHROPOIETIN

Eugene Goldwasser; Clifford Kavinsky, and Tania L. Weiss, all of Chicago, Ill., assignors to University Patents, Inc., Westport, Conn.

Filed Sep. 13, 1982, Ser. No. 417,429
Int. Cl.[4] G01N *33/54;* **C12P** *21/00;* **C12N** *5/00, 5/02;* **A61K** *39/00, 35/14, 37/00*
U.S. Cl. 435—7 **10 Claims**

1. A novel hybridoma cell line, ATCC No. CRL 8164, that produces a monoclonal antibody having specific binding affinity to and lacking neutralization of erythropoietin.

4,558,006

A.T.C.C. HB8209 AND ITS MONOCLONAL ANTIBODY TO ERYTHROPOIETIN

Joan C. Egrie, Thousand Oaks, Calif., assignor to Kirin-Amgen, Inc., Thousand Oaks, Calif.

Filed Feb. 4, 1983, Ser. No. 463,724
Int. Cl.[4] G01N *33/54;* **C12N** *15/00;* **C12P** *21/02;* **C12R** *1/91*
U.S. Cl. 435—7 **8 Claims**

1. As a new composition, a hybridoma cell line A.T.C.C. HB8209 that produces a monoclonal antibody specifically immunoreactive with erythropoietin and with a polypeptide substantially duplicative of an amino acid sequence extant in erythropoietin.

4,558,007

PROCESS FOR DETECTING LDH_5 ISOZYME ACTIVITY IN HUMAN SERUM FOR USE AS A DIAGNOSTIC AID AND FOR MONITORING RESPONSE TO CANCER THERAPY

Garth R. Anderson, South Wales; Kenneth F. Manly, and Arnold Mittelman, both of Buffalo, all of N.Y., assignors to Health Research, Inc. (Roswell Park Divison), Buffalo, N.Y.

Filed Jun. 17, 1983, Ser. No. 505,190
Int. Cl.[4] C12Q *1/32*
U.S. Cl. 435—26 15 Claims

1. In a known process for quantitatively detecting LDH_5 isozyme in human serum utilizing reverse polarity electrophoresis on an imidazole/borate buffered polyacrylamide gel matrix according to known techniques, followed by staining the gel matrix using standard nitroblue tetrazolium/phenazine methasulfate or an equivalent staining solution, the improvement comprising continuously contacting said gel matrix with said staining solution having a constant temperature between 30°–40° C. for at least 3 hours in the absence of both oxygen and light to provide a suitable stain reaction time.

4,558,008

PROCESS FOR PRODUCTION OF A-51568B ANTIBIOTIC

LaVerne D. Boeck; Gary G. Marconi, and Marvin M. Hoehn, all of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Dec. 13, 1983, Ser. No. 561,008
Int. Cl.[4] C12P *19/60;* C12N *1/20;* C12R *1/365*
U.S. Cl. 435—75 3 Claims

1. The method of producing a mixture of antibiotics A-51568 and A-51568B, which comprises cultivating *Nocardia orientalis* NRRL 15232, or an A-51568 and A-51568B-producing mutant or variant thereof, in a culture medium containing assimilable sources of carbon, nitrogen, and inorganic salts under submerged aerobic fermentation conditions until a substantial amount of antibiotic activity is produced.

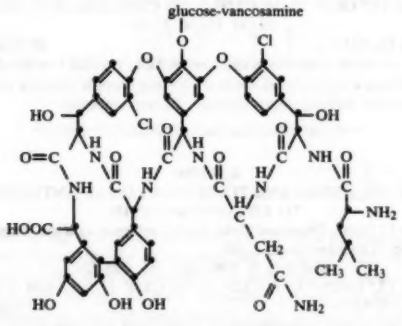
4,558,009

PROCESS FOR PRODUCING ANTIBIOTIC A-51568 BY FERMENTATION AND MICROORGANISM

LaVerne D. Boeck; Marvin M. Hoehn, and Gary G. Marconi, all of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 450,880, Dec. 20, 1982, abandoned. This application Dec. 27, 1983, Ser. No. 565,314
Int. Cl.[4] C12P *19/60;* C12N *1/20;* C12R *1/365*
U.S. Cl. 435—75 2 Claims

1. The method of producing antibiotic A-51568, which has the structure



and its pharmaceutically-acceptable, non-toxic salts, which comprises (1) cultivating *Nocardia orientalis* NRRL 15232, or an A-51568-producing mutant or variant thereof, in a culture medium containing assimilable sources of carbon, nitrogen, and inorganic salts under submerged aerobic fermentation conditions until a substantial amount of antibiotic activity is produced, (2) isolating the mixture of A-51568 and A-51568B from the culture medium and (3) isolating A-51568 from the mixture of A-51568 and A-51568B.

4,558,010

RECOMBINANT DEOXYRIBONUCLEIC ACID WHICH CODES FOR PLASMINOGEN ACTIVATOR AND METHOD OF MAKING PLASMINOGEN ACTIVATOR PROTEIN THEREFROM

Paul P. Hung, Waukegan; Shaw-Guang Lee, Libertyville; Ranajit Roychoudhury, Wadsworth, all of Ill., and Barry J. Ratzkin, Houston, Tex., assignors to Abbott Laboratories, North Chicago, Ill.

Division of Ser. No. 137,032, Apr. 3, 1980, Pat. No. 4,370,417. This application Sep. 7, 1982, Ser. No. 415,491
Int. Cl.[4] C12P *21/00*
U.S. Cl. 435—212 1 Claim

1. The plasminogen activator protein produced by a polydeoxribonucleotide segment which codes for plasminogen activator protein included in a transformant microorganism, said product having substantially the characteristics of urokinase.

4,558,011

METHOD FOR PREPARATION OF PURE HEPATITIS B SURFACE ANTIGEN FROM HUMAN PLASMA

Witold Brzosko; Piotr Janicki; Zbigniew Laskowski; Kazimierz Madaliński, and Andrzej Dabrowa, all of Warsaw, Poland, assignors to Akademia Medyczna, Warsaw, Poland

Filed Jun. 7, 1982, Ser. No. 386,182
Claims priority, application Poland, Jun. 10, 1981, 231588
Int. Cl.[4] C07G *7/00;* A61K *39/29*
U.S. Cl. 435—272 3 Claims

1. A method for preparing pure hepatitis B surface antigen from human plasma containing hepatitis B antigen which comprises the steps of (a) subjecting said plasma to a delipidization treatment, (b) digesting the thus-treated plasma with pepsin in an amount within the range of 0.05–0.50 mg per mg of plasma protein and for a time sufficient to selectively degrade the plasma proteins in said plasma to a molecular size less than about 100,000 Daltons without degradation of said surface antigen, (c) then filtering the thus-digested plasma through a molecular filter capable of passing therethrough particles up to 100,000 Daltons in size while retaining particles in excess of that size, said digested plasma being diluted prior to such filtration with a phosphate buffered medium having a pH of 7.1–7.3, (d) recovering from said molecular filter the particles in excess of 100,000 Daltons containing said surface antigen and (e) treating the thus-recovered material with formaldehyde at a concentration and for a time sufficient to inactivate any infectious hepatitis B viruses present therein without inactivating said hepatitis B surface antigen.

4,558,012

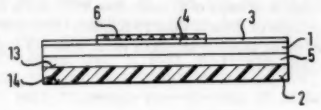
METHOD AND MEMBER FOR DETECTING AND/OR MEASURING THE CONCENTRATION OF A CHEMICAL SUBSTANCE

B. Hakan Nygren, Billdal; E. Torbjörn Sandström, Mölndal; Johan E. Stenberg, and Lars B. Stiblert, both of Gothenburg, all of Sweden, assignors to Sagax Instrument AB, Taby, Sweden

Filed Apr. 26, 1983, Ser. No. 488,794
Claims priority, application Fed. Rep. of Germany, Apr. 26, 1982, 3215484
Int. Cl.[4] G01N *33/54, 21/54*
U.S. Cl. 436—501 28 Claims

1. A member for detection of a chemical substance in a medium, comprising: a non-metal substrate having a surface; a first dielectric SiO_2 layer overlying said substrate; a detection

reactant on the first dielectric layer and capable of reacting with the substance to be detected such that an optically detectable layer of the substance to be detected is. formed on the detection reactant upon the introduction of said member into a medium to be investigated; and at least one further dielectric layer between said surface of said substrate and the first dielectric layer and of such a thickness and with such a refractive index that in operation of the member having an overall layer



array including the first and further dielectric layers, the detection reactant and thereon the layer of substance to be detected, the overall layer array operates to reduce reflection in respect of non-monochromatic light which is reflected at said surface of the substrate, in the wavelength range of from 525 to 600 nm.

6. A member as set forth in claim 1 wherein said detection reactant is an antigen.

4,558,013

CALIBRATED REACTION MEASUREMENT SYSTEM

Vincent A. Marinkovich, Palo Alto; David H. Riege, Newark, and John W. Dyminski, Cupertino, all of Calif., assignors to Mast Immunosystems, Ltd., Mountain View, Calif.

Filed Apr. 8, 1983, Ser. No. 483,292

Int. Cl.[4] G01N *33/58, 21/00*

U.S. Cl. 436—513 **27 Claims**

18. A method for measuring the magnitudes of reactions occurring between a predetermined class of components in a liquid specimen and a plurality of separate, coated test regions on a carrier, the carrier further including a separate uncoated negative reference region and being adapted for simultaneous contact of its plurality of regions with the liquid specimen, any resulting reaction on each test region indicating both a specific reaction of a particular component in the class of components and non-specific reactions of the class of components, and any resulting reaction on the negative reference region indicating non-specific reactions of the class of components, the method comprising steps of:

measuring the magnitude of the reaction occurring on each region of the carrier; and

adjusting the measurement of each test region in accordance with the measurement of the uncoated negative reference region, to correct for the effects of non-specific reactions and thereby produce a corrected measurement of the reaction occurring on each test region.

4,558,014

ASSAY APPARATUS AND METHODS

Tomas B. Hirschfeld, Livermore, Calif., and Myron J. Block, 334 N. Main St., North Salem, N.H. 03073, assignors to Myron J. Block, North Salem, N.H.

Filed Jun. 13, 1983, Ser. No. 503,500

Int. Cl.[4] G01N *33/54, 21/00, 21/64, 33/58*

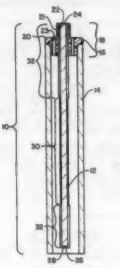
U.S. Cl. 436—527 **10 Claims**

1. Apparatus for use in assays of fluid suspensions, said apparatus comprising:

means for delimiting a first volume of said fluid suspension;

means for introducing a pre-established quantity of a fluorescent material into said first volume, said fluorescent material being soluble in a unique fluid phase of said suspension and being capable when so dissolved of emitting fluorescent radiation when optically excited;

means for delimiting within said first volume a second volume limited to primarily a single phase of said suspension and



throughout which fluorescence in said fluorescent material may be optically excited and observed.

4,558,015

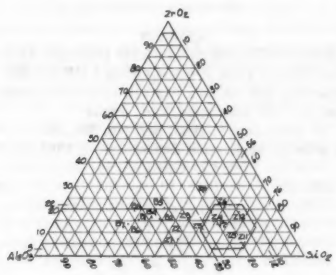
CHEMICALLY RESISTANT REFRACTORY FIBER

Wendell G. Ekdahl, DeLand, Fla.; Asit R. Chaudhuri, and William C. Miiller, both of Littleton, Colo., assignors to Manville Service Corporation, Denver, Colo.

Continuation-in-part of Ser. No. 487,624, Apr. 22, 1983, abandoned. This application Feb. 4, 1985, Ser. No. 698,052

Int. Cl.[4] C03C *3/04, 13/00*

U.S. Cl. 501—38 **1 Claim**



1. A chemically resistant, temperature resistant, synthetic, inorganic, glass fiber, consisting of, by weight percent:

SiO_2: 56–76%

Al_2O_3: 12–33%

ZrO_2: 3–22%

said fiber being essentially free of alkali and alkaline earth metal oxides, said fibers being essentially chemically inert in both alkaline and acidic environments and capable of withstanding temperatures exceeding 500° F. (260° C.) in such environments with virutally no loss of tensile strength.

4,558,016

CERAMIC FIBER REINFORCED REFRACTORY

Stanley O. Bronson, Mountainside; John R. Peterson, Budd Lake, and Edward B. Schumacher, Holmdel, all of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Aug. 18, 1980, Ser. No. 178,920

Int. Cl.[4] C04B *35/02, 35/80*

U.S. Cl. 501—95 **28 Claims**

1. A reinforced refractory product comprising a refractory material having ceramic fibers in yarn form in an approximate percentage by weight of the total in a range from 0.25 to 1.0

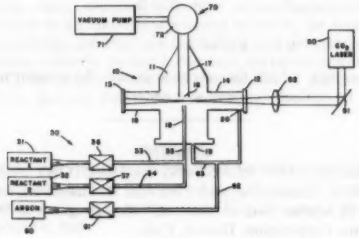
distributed therein, said fibers being in yarn form for the purpose of enhancing the modulus of rupture of said product.

4,558,017

LIGHT INDUCED PRODUCTION OF ULTRAFINE POWDERS COMPRISING METAL SILICIDE POWDER AND SILICON

Arunava Gupta, Madison; Gary A. West, Dover, and James T. Yardley, Morristown, all of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed May 14, 1984, Ser. No. 609,629
Int. Cl.[4] B01J *19/12;* **C01B** *33/06;* **C04H** *35/58*
U.S. Cl. 501—96 **10 Claims**



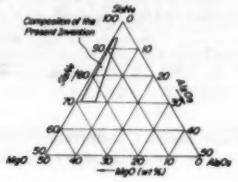
1. A mixture of powders, said mixture comprising at least about 50 weight percent metal silicide and at least about 5 weight percent free silicon.

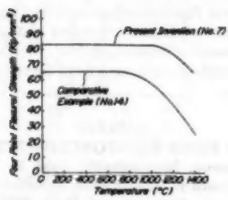
4,558,018

SILICON NITRIDE SINTERED BODIES AND A METHOD FOR PRODUCING THE SAME

Keiji Matsuhiro, and Minoru Matsui, both of Nagoya, Japan, assignors to NGK Insulators, Ltd., Japan

Filed Jun. 8, 1983, Ser. No. 502,288
Claims priority, application Japan, Apr. 4, 1983, 58-57915
Int. Cl.[4] C04B *35/58*
U.S. Cl. 501—97 **2 Claims**





1. Pressureless sintered silicon nitride bodies consisting of silicon nitride combined with MgO and Al_2O_3, in a total amount of at least 7.9% by weight of MgO and Al_2O_3 in the pressureless sintered bodies and not greater than 30% by weight of MgO and Al_2O_3 in the pressureless sintered bodies, wherein a weight ratio of MgO/Al_2O_3 is within a range of 7–9.3 and crystalline phases contained in the pressureless sintered bodies consist essentially of crystalline Si_3N_4, magnesium sialon and forsterite, said magnesium sialon being represented by the general formula

$$Mg_{x/2}Si_{6-y+x/2}Al_{y-x}O_yN_{8-y}$$

wherein $0<x\leqq y<8$, $x/y=2R/(1+2R)$, wherein R is a molar ratio of Mg/Al, and $0.9\leqq x/y<1$, and said forsterite being represented by the formula Mg_2SiO_4, said sintered bodies having a relative density of greater than 95% and a four point flexural strength of greater than 55 Kg/mm^2 at 1,400° C. in air and a four point flexural strength of at least 76 Kg/mm^2 at room temperature.

4,558,019

PERICLASE REFRACTORY BRICK WITH OXYHYDROCARBON COMPONENT

Abraham M. Kotliar, Union County; John P. Sibilia, Essex County, both of N.J.; Ronald H. Hughes, and Richard A. Landy, both of Centre County, Pa., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Jan. 20, 1984, Ser. No. 572,727
Int. Cl.[4] C04B *35/52*
U.S. Cl. 501—101 **7 Claims**

1. In a periclase refractory composition comprising magnesium oxide granules, carbon granules and a carbonaceous binding material capable of undergoing pyrolytic decomposition, the improvement wherein the periclase refractory composition further comprises at least one oxyhydrocarbon compound selected from the group consisting of:

(a) acyclic carboxylic acids of at least 14 carbons,

(b) oxidized polyolefin waxes,

(c) poly(alkylene oxides) and ethers thereof,

(d) copolymers of an olefin with at least one monomer selected from the group consisting of unsaturated carboxylic acids, vinyl esters and vinyl alcohol; and

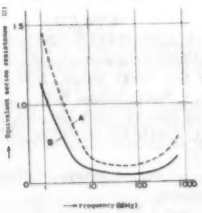
(e) polyvinyl alcohol.

4,558,020

CERAMIC HIGH DIELECTRIC COMPOSITION

Gen Itakura, Hirakata; Hideki Kuramitsu, Moriguchi; Takashi Iguchi, Katano; Takayuki Kuroda, Nishinomiya, and Kaneomi Nagase, Kyoto, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

PCT No. PCT/JP82/00252, § 371 Date Mar. 7, 1983, § 102(e) Date Mar. 7, 1983, PCT Pub. No. WO83/00145, PCT Pub. Date Jan. 20, 1983
PCT Filed Jul. 2, 1982, Ser. No. 474,680
Claims priority, application Japan, Jul. 8, 1981, 56-107257
Int. Cl.[4] C04B *35/46*
U.S. Cl. 501—137 **1 Claim**



1. A ceramic high dielectric composition which consists of 1 to 5 parts by weight of $CaTiO_3$ and from 2 to 3 parts by weight of Nb_2O_5 per 100 parts by weight of $BaTiO_3$ as the host material.

4,558,021
CERAMIC HIGH DIELECTRIC COMPOSITION

Takuoki Hata, Neyagawa; Akira Ohmi, Hirakata; Tadayoshi Ushijima, Kadoma, and Takayuki Kuroda, Nishinomiya, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

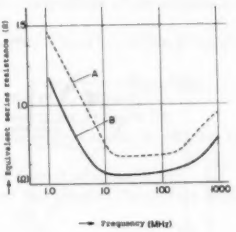
PCT No. PCT/JP83/00194, § 371 Date Feb. 16, 1984, § 102(e) Date Feb. 16, 1984, PCT Pub. No. WO84/00076, PCT Pub. Date Jan. 5, 1984

PCT Filed Jun. 17, 1983, Ser. No. 582,570

Claims priority, application Japan, Jun. 18, 1982, 57-105915; Jun. 18, 1982, 57-105916; Jun. 18, 1982, 57-105917; Jun. 18, 1982, 57-105918; Jul. 7, 1982, 57-118959; Nov. 10, 1982, 57-197003; Nov. 10, 1982, 57-197004; Dec. 24, 1982, 57-231820; Dec. 27, 1982, 57-231562; Dec. 27, 1982, 57-231563; Dec. 27, 1982, 57-231564; Dec. 28, 1982, 57-232742

Int. Cl.⁴ C04B *35/46*

U.S. Cl. 501—137 **12 Claims**



2. A ceramic high dielectric composition which consists essentially of, in parts by weight:

1 to 5 parts of $CaTiO_3$,

1 to 4 parts of Sb_2O_3, and

1 to 5 parts of La_2O_3

per 100 parts of $BaTiO_3$ as the host material, the ceramic composition having a dielectric constant $\epsilon 25$ of at least 3,000 measured at 25° C. with 1 KHz at 1 V(AC), tan δ not more than 2.0% measured at an effective voltage of 50 V/mm and a bending strength of at least 690 kg/cm^2.

4. A ceramic high dielectric composition which consists essentially of, in parts by weight:

1 to 5 parts of $CaTiO_3$,

1 to 4 parts of Sb_2O_3,

1 to 5 parts of Nd_2O_3, and

0.1 to 1 parts of SiO_2

per 100 parts of $BaTiO_3$ as the host material, the ceramic composition having a dielectric constant $\epsilon 25$ of at least 3,000 measured at 25° C. with 1 KHz at 1 V(AC), tan δ not more than 2.0% measured at an effective voltage of 50 V/mm and a bending strength of at least 690 kg/cm^2.

8. A laminated ceramic capacitor made of the composition of claim 2.

4,558,022
REGENERATION OF CAUSTIC IMPREGNATED ACTIVATED CARBONS

John J. Farmerie, Coraopolis, Pa., assignor to Calgon Carbon Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 246,766, Mar. 23, 1981, abandoned, which is a continuation-in-part of Ser. No. 231,485, Feb. 6, 1981, abandoned. This application Nov. 21, 1984, Ser. No. 673,804

Int. Cl.⁴ B01J *20/34;* **B01D** *53/04*

U.S. Cl. 502—25 **5 Claims**

1. A process for the regeneration of spent caustic impregnated activated carbon by removing organic and sulfur compound contaminants which consists of:

(a) wetting the spent carbon with water at a minimum temperature of 33° F. to dearate said carbon; and

(b) treating the wetted spent carbon with a solution of from 35 to 50 percent caustic at a temperature range of from 72° to 180° F. for a contact time of from 13 to 24 hours to remove organic contaminants; and

(c) treating the spent carbon from step (b) with a solution of from 5 to 25 percent caustic at a temperature range of from 72° to 180° F. for a contact time of from 3 to 24 hours to remove sulfur contaminants.

2. The process of claim 1 wherein the caustic is NaOH or KOH.

3. The process of claim 1 wherein the concentration of the initial caustic solution is 50 percent and the contact time is about 18 hours at a temperature of 140° F.

4,558,023
PROCESS FOR THE PREPARATION OF AN ACTIVE SOLID HYDROCARBON WHICH CAN BE USED TO POLYMERIZE OLEFINES, AND A PROCESS FOR THE SYNTHESIS OF AN OLEFINIC POLYMER OR COPOLYMER USING THE SAID ACTIVE HYDROCARBON AS A CATALYTIC SYSTEM

Claude Brun, Idron Bizanos; Auguste Cheux, Arthez, and Robert Pelletier, Billere, all of France, assignors to Atochem, Courbevoie, France

Filed Feb. 23, 1984, Ser. No. 583,102

Claims priority, application France, Feb. 28, 1983, 83 03229

Int. Cl.⁴ C08F *4/62, 4/64, 4/68*

U.S. Cl. 502—108 **29 Claims**

1. Process for the preparation of an active solid hydrocarbon which can be used to polymerize olefins characterized in that it comprises forming a homogeneous pulverulent composition by combining (a) a component comprising a transition metal compound wherein said metal is chosen from Ti, V, Zr and Cr, in the form of particles having an average diameter of between 0.1 and 500 microns, (b) an inert porous organic or inorganic solid support in the form of a powder wherein said powder has a mean particle diameter of from 1 to 5,000 microns, and (c) a liquid phase containing at least one compound chosen from the organometallic compounds of the metals of groups I to III of the Periodic Table of the Elements, the amounts of the component comprising the transition metal compound and of the organometallic compound or compounds being such that the ratio of the number of atoms of the metal or metals of groups I to III of the Periodic Table to the number of atoms of transition metal is between 0.1 and 800, while the amount of support powder is adjusted so that the mixture produced remains in pulverulent form, and polymerizing, in contact with the above pulverulent composition, one or more C_2 to C_{12} olefins so that an active solid hydrocarbon containing an amount by weight of transition metal of between 10 and 50,000 ppm is produced, this polymerization being carried out in the gas phase at a temperature below the melting point of the active solid hydrocarbon, whilst an hourly conversion of the C_2 to C_{12} olefin or olefins of less than 500,000 g per gram of transition metal is maintained.

4,558,024
POLYMERIZATION CATALYST, PRODUCTION AND USE

Steven A. Best, Houston, Tex., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Aug. 6, 1984, Ser. No. 638,165

Int. Cl.⁴ C08F *4/62, 4/64, 4/68*

U.S. Cl. 502—115 **33 Claims**

1. A transition metal containing catalyst component comprising the solid reaction product obtained by treating an inert solid support material in an inert solvent with (A) an organometallic compound of a Group IIa, IIb or IIIa metal wherein all the metal valencies are satisfied with a hydrocarbon group, optionally (B) an oxygen containing compound selected from ketones, aldehydes, alcohols, siloxanes or mixtures thereof, (C) at least one transition metal compound of a Group IVb, Vb, VIb or VIII metal, and (D) a Group IIIa metal hydrocarbyl dihalide with the proviso that if the oxygen containing alcohol,

aldehyde, ketone or siloxane is employed the inert solid support material can be treated with (i) the (A) organometallic compound and the (B) oxygen containing compound simultaneously, (ii) the reaction product of the (A) organometallic compound and (B) oxygen containing compound or (iii) the (B) oxygen containing compound followed by treating with the (A) organometallic compound.

4,558,025

POLYMERIZATION CATALYST, PRODUCTION AND USE

Steven A. Best, Houston, Tex., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Aug. 6, 1984, Ser. No. 638,168

Int. Cl.[4] C08F *4/62, 4/64, 4/68*

U.S. Cl. 502—115 **36 Claims**

1. A transition metal containing catalyst component comprising the solid reaction product obtained by treating an inert solid support material in an inert solvent sequentially with (A) an organometallic compound of a Group IIa, IIb or IIIa metal wherein all the metal valencies are satisfied with a hydrocarbon group, (B) an oxygen containing compound selected from ketones, aldehydes, alcohols siloxanes or mixtures thereof, (C) an acyl halide, (D) at least one transition metal compound of a Group IVb, Vb, VIb or VIII metal , (E) a Group IIIa metal hydrocarbyl dihalide with the proviso that the inert solid support material can alternatively be treated with (i) the (A) organometallic compound and the (B) oxygen containing compound simultaneously, (ii) the reaction product of the (A) organometallic compound and (B) oxygen containing compound or (iii) the (B) oxygen containing compound followed by treating with the (A) organometallic compound.

4,558,026

CATALYST COMPRISING TELLURIUM CHEMICALLY BOUND TO AROMATIC POLYMER

William F. Brill, Skillman, N.J., assignor to The Halcon SD Group, Inc., New York, N.Y.

Division of Ser. No. 425,787, Sep. 28, 1982, Pat. No. 4,480,113. This application Aug. 24, 1984, Ser. No. 643,922

Int. Cl.[4] B01J *31/06;* **C08F** *8/42;* **C07C** *165/00*

U.S. Cl. 502—159 **4 Claims**

1. The method of preparing a solid epoxidation catalyst which comprises reacting a co-polymer of styrene and divinyl benzene containing by weight 5 to 20% divinyl benzene with tellurium tetrahalide at a temperature of 20° to 250° C. for 1 to 100 hours to form a reaction product containing 0.2 to 20% by weight tellurium calculated as elemental tellurium chemically bound to aromatic groups of said co-polymer, and hydrolyzing said product to form said epoxidation catalyst.

2. The method of claim 1 wherein the tellurium compound is tellurium tetrachloride.

3. Catalyst prepared by the method of claim 1.

4,558,027

CATALYSTS FOR CARBON AND COAL GASIFICATION

Douglas W. McKee, Burnt Hills; Clifford L. Spiro, Scotia, and Philip G. Kosky, Schenectady, all of N.Y., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

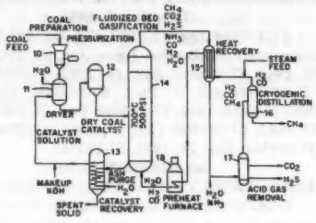
Filed May 25, 1984, Ser. No. 614,077

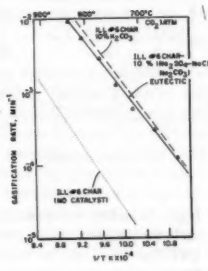
Int. Cl.[4] B01J *21/20, 27/08, 27/02;* **C01J** *3/54*

U.S. Cl. 502—181 **5 Claims**

1. A catalyst for use in the process of producing methane from particulate carbonaceous material, comprising a catalyst composition deposited on surface portions of said particulate carbonaceous material and formed of a mixture of alkali metal salts consisting essentially of at least one of an alkali metal carbonate and an alkali metal sulfate together with at least one of an alkali metal halide and an alkali metal carbonate differing from the first-mentioned alkali metal carbonate, said catalyst composition being prepared from a solidified melt of said mixture of alkali metal salts formed prior to being deposited upon said particulate carbonaceous material and with the alkali metal salts forming said mixture each being in a concentration adequate to render the resulting catalyst composition eutectic.

2. The catalyst claimed in claim 1, wherein the alkali metal carbonates are selected from the group consisting of Cs_2CO_3, K_2CO_3, Na_2CO_3, Li_2CO_3 and Rb_2CO_3, wherein the alkali metal halide is selected from the group consisting of KCl, KF,





LiCl, NaCl, and NaF and wherein the alkali metal sulfate is selected from the group consisting of Na_2SO_4, K_2SO_4, Cs_2SO_4 and Li_2SO_4.

5. The catalyst claimed in claim 1, wherein the mixture of alkali metal salts is melted to form the eutectic catalyst composition which is then solidified and ground into particulate form prior to deposition of the resulting particulates of the eutectic catalyst composition on the particulate carbonaceous material.

4,558,028

CATALYST FOR PRODUCTION OF METHACRYLIC ACID

Hideaki Tsuneki, Osaka; Michio Ueshima, Nishinomiya; Ryuji Aoki, Himeji, and Isao Nagai, Suita, all of Japan, assignors to Nippon Shokubai Kagaku Kogyo Co., Ltd., Osaka, Japan

Filed Dec. 16, 1983, Ser. No. 562,007

Claims priority, application Japan, Dec. 22, 1982, 57-223954

Int. Cl.[4] B01J *27/14;* **C07C** *51/16*

U.S. Cl. 502—211 **3 Claims**

1. A catalyst for production of methacrylic acid, said catalyst being molded in a ring-like shape having an outside diameter of 3.0 to 10.0 mm, an inside diameter of 0.1 to 0.7 times the outside diameter and a length of 0.5 to 2.0 times the outside diameter, said catalyst consisting essentially of a catalytically active material having the composition represented by the following general formula

$$Mo_aP_bA_cB_dC_eD_fO_x$$

wherein Mo is molybdenum, P is phosphorus, A is at least one element selected from the group consisting of arsenic, antimony, germanium, bismuth, zirconium and selenium, B is at least one element selected from the group consisting of copper, iron, chromium, nickel, manganese, cobalt, tin, silver, zinc and

rhodium, C is at least one element selected from the group consisting of vanadium, tungsten and niobium, D is at least one element selected from the group consisting of alkali metals, alkaline earth metals and thallium, and O is oxygen, and a, b, c, d, e, f and x represent the atomic ratios of Mo, P, A, B, C, D and O provided that when a is 12, b is 0.5 to 4, c is 0 to 5, d is 0 to 3, e is 0 to 4 and f is 0.01 to 4 and x is a number determined by the oxidation states of the individual elements.

4,558,029

ANTIMONY-CONTAINING C_4 OXIDATION CATALYSTS

Christos Paparizos, Willowick; Robert S. Shout, Bedford Heights, and Wilfrid G. Shaw, Lyndhurst, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Continuation of Ser. No. 417,773, Sep. 13, 1982, abandoned. This application Jan. 11, 1985, Ser. No. 690,823

Int. Cl.[4] B01J *27/19, 27/198;* **C07C** *51/16*

U.S. Cl. 502—211 **14 Claims**

1. A catalytic composition of the empirical formula:

$$Mo_{12}P_{0.1\text{-}3}M_{0.1\text{-}3}Cu_{0.1\text{-}2}V_{0.1\text{-}2}Sb_{0.01\text{-}2}X_{0.01\text{-}2}Y_aO_x$$

where

M is at least one of K, Rb and Cs;

X is at least one of Ba, Hg, and Pb;

Y is at least one of Fe, Co, Ni, Sr, Mn, In, Ta, Ge, S and Be when $a>0$;

a is a number from 0 to about 2; and

X is a number that satisfies the valence requirements of the other elements.

4,558,030

RUTHENIUM-RHENIUM CATALYST ON TITANIA SUPPORT FOR FISCHER-TROPSCH SYNTHESIS

Kym B. Arcuri; Charles H. Mauldin, and Dave H. Shaw, all of Baton Rouge, La., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Jun. 29, 1984, Ser. No. 626,024

Int. Cl.[4] B01J *21/06, 23/64*

U.S. Cl. 502—325 **13 Claims**

1. A catalyst composition useful for the synthesis of hydrocarbons from admixtures of carbon monoxide and hydrogen at reaction conditions which comprises: ruthenium in catalytically active amount composited with titania, or titania-containing support, having a rutile:anatase ratio of at least about 2:3 and rhenium in amount sufficient to provide a weight ratio of rhenium:ruthenium which ranges from about 2:1 to about 1:4, sufficient at corresponding reaction conditions to obtain improved activity maintenance vis-a-vis a ruthenium catalyst otherwise similar except that it does not contain rhenium.

4,558,031

HIGH POROSITY CATALYST

Marten Ternan, Hazeldean, and Basil I. Parsons, Kars, both of Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of Energy, Mines and Resources of Canada, Ottawa, Canada

Filed Jan. 24, 1983, Ser. No. 460,598

Int. Cl.[4] B01J *23/08, 35/00*

U.S. Cl. 502—355 **6 Claims**

1. A method of producing catalysts or catalyst supports having both high surface area and large pore sizes which comprises mixing an alumina with water and nitric acid to form an alumina gel consisting of a loose three dimensional network, the acid being present in an amount of at least 250 parts of 70% HNO_3 per 100 parts of alumina, slowly drying the gel at a temperature below the boiling point of water whereby water is removed from the interior of the pore structure to a water content of less than 20% by weight leaving the three dimensional network intact, and thereafter calcining the dried product to form a catalyst or catalyst support having a surface area greater than 200 m^2/g and a volume of greater than 0.7 ml/g of macropores having diameters between 1 and 50 μm.

4,558,032

SYNTHETIC WHOLE BLOOD SUBSTITUTE AND A METHOD OF MAKING THE SAME

Charles S. Ecanow, Skokie, and Bernard Ecanow, Wilmette, both of Ill., assignors to Neomed Inc., Wilmette, Ill.

Continuation-in-part of Ser. No. 336,061, Dec. 31, 1981, abandoned, which is a continuation-in-part of Ser. No. 222,364, Jan. 5, 1981, Pat. No. 4,343,797, which is a continuation-in-part of Ser. No. 146,029, May 2, 1980, abandoned, which is a continuation-in-part of Ser. No. 47,071, Jun. 11, 1979, abandoned. This application Jun. 29, 1983, Ser. No. 509,282

Int. Cl.[4] A61K *37/02*

U.S. Cl. 514—2 **19 Claims**

1. A method of preparing a synthetic whole blood substitute which comprises the steps of:

(a) mixing thoroughly 5 to 15% weight to volume of a gelatin selected from modified fluid gelatin or gelatin powder with 5 to 15% weight to volume of acacia which has been dispersed in sterile water;

(b) storing the solution undisturbed at a temperature of from about 4° to 10° C. for 12 to 72 hours to produce a two phase coacervate system comprising an aqueous coacervate phase and a bulk water phase;

(c) adjusting the pH of said system within the range of whole human blood by the addition of an alkaline substance; and

(d) adding such amount of a salt to said system as will make it isotonic with whole human blood.

15. A synthetic whole blood substitute comprising an aqueous solution of about 5 to 15% weight to volume acacia, about 5 to 15% weight to volume of a gelatin selected from modified fluid gelatin or gelatin powder; an alkaline substance sufficient to adjust the pH to that of whole human blood; and an amount of a salt sufficient to render the solution isotonic with whole human blood; said components forming a coacervate system having a coacervate phase and an equilibrium bulk water phase.

4,558,033

POTENTIATION OF THE EFFECTS OF INSULIN BY PEPTIDES

Christopher G. Rudman, Thousand Oaks, Calif., assignor to Amgen, Thousand Oaks, Calif.

Filed Jun. 6, 1983, Ser. No. 501,023

Int. Cl.[4] A61K *37/26, 37/00*

U.S. Cl. 514—4 **5 Claims**

1. In the method for securing reduction of circulating glucose in mammals by administering exogenous insulin to the mammal, the improvement comprising augmenting the physiological effectiveness of insulin administered by contemporaneously administering an effective amount of deletion peptide.

4,558,034

INHIBITORS OF BACTERIAL COLLAGENASE

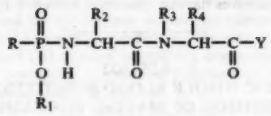
Richard E. Galardy, and Damian Grobelny, both of Lexington, Ky., assignors to The Board of Trustees of the University of Kentucky, Lexington, Ky.

Filed Jan. 31, 1984, Ser. No. 576,005

Int. Cl.[4] A61K *37/00;* **C07C** *103/52*

U.S. Cl. 514—7 **11 Claims**

1. A method for inhibiting bacterial collagenase in vivo wherein the bacteria are selected from the group consisting of Clostridium and Pseudomonas, which comprises administering to a human being a collagenase inhibiting effective amount of a pharmaceutical composition including a compound of the formula:



wherein R is alkyl, aralkyl, aryl, alkoxy, aryloxy, hydroxy or pharamceutically acceptable salts thereof; R_1 is hydrogen, alkali metal, lower alkyl, phenyl lower alkyl, or phenyl, or substituted phenyl wherein the substituent is halo, lower alkoxy or lower alkyl or nitro or carboxy or cyano, and pharmaceutically acceptable salts thereof; R_2, R_3 and R_4 are hydrogen or alkyl; R_2 and R_4 are selected from the group consisting of straight and branched chain alkyl, hydroxy alkyl, carboxy alkyl, aralkyl, amino alkyl, carboxamide alkyl, mercapto alkyl, phenyl alkyl, hydroxy phenyl alkyl, guanidino alkyl, imidazoyl alkyl, indolyl alkyl, and pyrrolidinyl; R_3 and R_4 may be connected together to form an alkylene bridge of from 2 to 4 carbon atoms; Y is alkoxy, aryloxy, primary amide, alanine benzyl ester or

where R_5 and R_6 is hydrogen or alkyl; R_5 and R_6 may be connected together to form an alkylene bridge of from 2 to 4 carbon atoms; and X is hydroxyl or pharmaceutically acceptable salts thereof, in admixture with a pharmaceutically acceptable carrier.

4,558,035

MATERIAL FOR USE IN THE TREATMENT OF SPONTANEOUS ABORTIONS

Peter M. Johnson, Wirral, England, assignor to The University of Liverpool, Liverpool, England

Filed Feb. 28, 1984, Ser. No. 584,420

Claims priority, application United Kingdom, Mar. 4, 1983, 8305967

Int. Cl.[4] A61K *35/50, 37/02, 39/00*

U.S. Cl. 514—8 **5 Claims**

1. A method for preventing recurrent spontaneous abortions in women, characterized in that the method comprises administering to a woman a material comprising material selected from isolated syncytiotrophoblast microvillous plasma membrane and protein and glycoprotein-containing fractions derived therefrom.

4,558,036

ACTAPLANIN ANTIBIOTICS

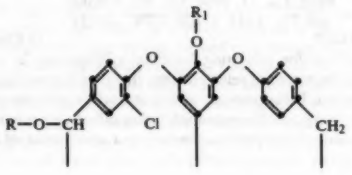
Kurt E. Merkel, Mooresville, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Feb. 17, 1984, Ser. No. 581,016

Int. Cl.[4] A61K *37/00;* **C07C** *103/52;* **C07H** *17/08*

U.S. Cl. 514—9 **12 Claims**

1. A compound of the formula



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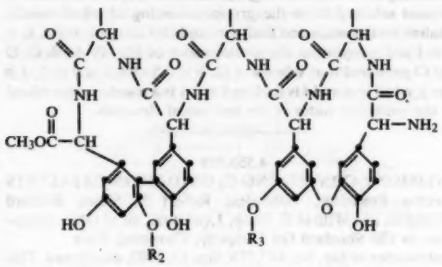


wherein R is L-ristosamine; R_1 is glucosyl; R_2 and R_3 are both mannose; and the pharmaceutically acceptable non-toxic salts thereof.

5. A method for treating infections in a mammal which comprises administering an antibiotically effective amount of actaplanin factor H of claim 1 or a pharmaceutically acceptable non-toxic salt thereof.

4,558,037

CARDIOVASCULAR COMPOSITION

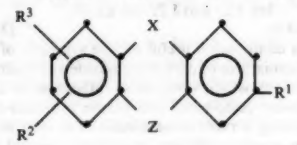
Chi-Chung Chan, Kirkland, and Anthony W. Ford-Hutchinson, Beaconsfield, both of Canada, assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jun. 4, 1984, Ser. No. 617,293

Int. Cl.[4] A61K *37/00*

U.S. Cl. 514—20 **12 Claims**

1. A cardiovascular composition useful for treating thrombosis comprising a pharmaceutically effective carrier; an antithrombotically effective amount of a dibenzo-thiepin compound (i) having the formula:



I

wherein:

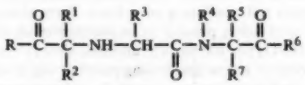
X is CH_2O, OCH_2, CH_2CH_2 or CH=CH;

Z is S, SO, or SO_2;

R^1 is CO_2H, CH=O, or CH_2OH;

R^2 and R^3 can each independently be hydrogen, halogen, nitro, loweralkyl, amino, N-loweralkylamino, N,N-diloweralkyl amino, loweralkanoyl, hydroxy, loweralkoxy, lower acyloxy, loweralkylthio, trifluoromethylthio, loweralkylsulfinyl, loweralkylsulfonyl, trifluoromethyl, or R^2 and R^3, when bonded to adjacent carbon atoms, can be joined to form a 5- or 6-membered hydrocarbon ring which can optionally contain a double bond, a carbonyl group, or a hydroxyl group;

and, an angiotensin converting enzyme inhibitor compound (ii) having the formula:



II

wherein:

R and R^6 can each independently be hydroxy, lower alkoxy, lower alkenoxy, arloweralkyloxy, amino, diloweralk-

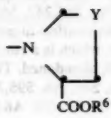
ylamino lower alkoxy, acylamino lower alkoxy or acyloxy lower alkoxy;

R^1 is alkyl having from 1–8 carbon atoms, substituted lower alkyl wherein the alkyl group has 1–5 carbon atoms and the substituent is amino, arylthio, aryloxy or arylamino, aralkyl or heteroalkyl wherein the alkyl portion has 1–3 carbon atoms, substituted aralkyl or heteroalkyl wherein the alkyl groups have 1–3 carbon atoms and the substituent(s) is halo, dihalo, amino, aminoalkyl, hydroxy, lower alkoxy or lower alkyl;

R^2 and R^7 are hydrogen;

R^3 is lower alkyl or amino lower alkyl;

R^4 and R5 can be joined together through the carbon and nitrogen atoms to which they are attached to form a ring of the formula:



wherein Y is CH_2, S, or CH—OCH_3 or the pharmaceutically acceptable salts thereof wherein said aryl is a member selected from the group consisting of phenyl or naphthyl and said heteroaryl is a member selected from the group consisting of pyridyl, thienyl, furyl, indolyl, benzthienyl, imidazoyl or thiazolyl; and, the pharmaceutically acceptable salts thereof, the weight ratio of said dibenzo-thiepin compound (i) to said angiotensin converting enzyme inhibitor compound (ii) in said composition being about 25 to 1.

4,558,038

N-SUBSTITUTED-AMINDO-AMINO ACIDS

Jerry W. Skiles, Tuckahoe; Raymond D. Youssefyeh, Tarrytown, both of N.Y.; John T. Suh, Greenwich, Conn., and Howard Jones, Ossining, N.Y., assignors to USV Pharmaceutical Corp., Tarrytown, N.Y.

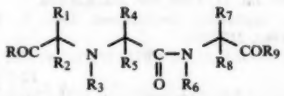
Continuation of Ser. No. 484,729, Apr. 13, 1983, Pat. No. 4,496,542, which is a continuation-in-part of Ser. No. 249,053, Mar. 30, 1981. This application Nov. 15, 1984, Ser. No. 672,328

The portion of the term of this patent subsequent to Jan. 29, 2002, has been disclaimed.

Int. Cl.[4] A61K *37/00;* **C07C** *103/52*

U.S. Cl. 514—20 **25 Claims**

1. Compounds of the formula



wherein

R and R_9 are independently hydroxy, lower alkoxy, lower alkenoxy, di(lower alkyl)amino-lower alkoxy, hydroxy-lower alkoxy, acylamino-lower alkoxy, acyloxy-lower alkoxy, aryloxy, aryloxy-lower alkoxy, amino, lower alkylamino, di-lower alkylamino, hydroxyamino, or aryl-lower alkylamino,

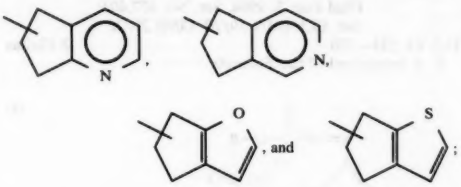
R_1, R_2, R_3, R_4, R_5, R_7 and R_8 are independently hydrogen, alkyl having from 1 to 20 carbon atoms, alkenyl having from 2 to 20 carbon atoms, alkynyl having from 2 to 20 carbon atoms, aryl-lower alkyl having from 7 to 12 carbon atoms, or heterocyclic-lower alkyl having from 6 to 12 carbon atoms,

R_6 is a heterocyclic group,

R_2 and R_3 taken together with the carbon and nitrogen to which they are respectively attached and R_3 and R_5 taken together with the nitrogen and carbon to which they are respectively attached may form an N-heterocycle containing from 3 to 5 carbon atoms or 2 to 4 carbon atoms and a sulfur atom, and wherein

the alkyl, alkenyl, and alkynyl groups may carry substituents selected from the group consisting of hydroxy, lower alkoxy, thio, lower alkylmercapto, amino, lower alkylamino, di(lower alkyl)amino, halogen, and nitro;

the heterocyclic groups are selected from the group consisting of indoline, indolylmethyl, pyridylmethyl, pyridylethyl, fused cyclopentylpyrrole, piperazinyl, tetrahydrothiazine, tetrahydrofurfuryl, benzodioxanyl, benzofurfuryl, tetrahydrothiophene-dioxide, tetrahydrothiopyranyl, benzothiazole, pyrimidyl, thienylmethyl,



the heterocyclic groups may carry one or more substituents selected from the group consisting of lower alkyl, lower alkenyl, lower alkynyl, hydroxy, lower alkoxy, amino, lower alkylamino, di(lower alkyl)amino, thiol, lower alkylmercapto, hydroxy-lower alkyl, amino-lower alkyl, thio-lower alkyl, nitro, halogen, trifluoromethyl, methylenedioxy, ureido, and guanidino; and

their pharmaceutically acceptable, nontoxic acid addition salts and where R or R_9 or both are hydroxy, their pharmaceutically acceptable basic salts.

4,558,039

PHOSPHORUS DERIVATIVES OF 2-FLUOROALKYL-5-PYRIMIDINOLS USEFUL AS INSECTICIDES

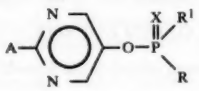
Walter Reifschneider, Walnut Creek, Calif., and Larry L. Larson, Omaha, Nebr., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 443,421, Nov. 22, 1982, abandoned. This application Jun. 11, 1984, Ser. No. 619,509

Int. Cl.[4] A01N *57/16, 57/32;* **C07D** *239/34;* **C07F** *9/65*

U.S. Cl. 514—86 **35 Claims**

1. A compound corresponding to the formula



wherein

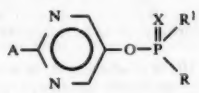
A represents perfluoroalkyl;

X represents oxygen or sulfur;

R represents alkoxy; and

R^1 represents alkyl, alkoxy, alkylthio, monoalkylamino or phenyl.

19. A method for the kill and control of insects which comprises contacting said insects or their habitat with a composition comprising an inert carrier in intimate admixture with an insecticidally effective amount of an active compound corresponding to the formula



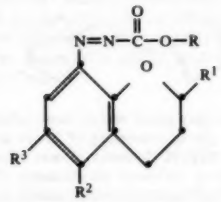
wherein
A represents perfluoroalkyl;
X represents oxygen or sulfur;
R represents alkoxy; and
R^1 represents alkyl, alkoxy, alkylthio, monoalkylamino or phenyl.

4,558,040
MITICIDAL (2-ALKYL-3,4-DIHYDRO-2H-1-BENZOPYRAN-8-YL)-DIAZENECARBOXYLIC ACID ESTERS

Kurt H. Pilgram, and Richard D. Skiles, both of Modesto, Calif., assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 3, 1984, Ser. No. 677,403
Int. Cl.[4] A61N *59/10*; C09B *29/22*
U.S. Cl. 514—150 **3 Claims**

1. A compound of the Formula



(I)

wherein R contains from one to three carbon atoms and is alkyl or alkenyl; R^1 is alkyl of one to three carbon atoms; R^2 and R^3 each is hydrogen, bromine, chlorine or alkyl of one to three carbon atoms, with the proviso that at least one of R^2 and R^3 is not hydrogen.

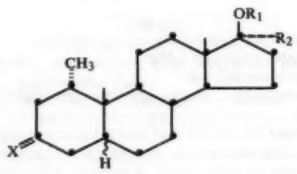
3. A method for protecting a plant from mites which comprises applying to the plant a miticidally effective dosage of a compound of claim 1.

4,558,041
ANTIANDROGENIC 17α-SUBSTITUTED STEROIDS

Rudolf Wiechert; Dieter Bittler; Annerose Schleusener, and Manfred Albring, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Division of Ser. No. 380,328, May 20, 1982, Pat. No. 4,456,600, which is a division of Ser. No. 198,383, Oct. 20, 1980, abandoned. This application Jun. 13, 1984, Ser. No. 620,216
Claims priority, application Fed. Rep. of Germany, Oct. 26, 1979, 2943776
Int. Cl.[4] C07J *1/00*; A61K *31/56*
U.S. Cl. 514—178 **8 Claims**

1. A 17α-substituted steroid of the formula



wherein
R_1 is hydrogen, an acyl group of a C_{1-17} optionally substituted, hydrocarbon carboxylic or sulfonic acid, C_{1-5} alkyl, C_{1-5}-alkenyl, C_{1-5}-alkyl or C_{1-5}-alkenyl interrupted by an oxa atom, cyclopentyl or tetrahydropyranyl,
R_2 is C_{5-6}-alkyl,
X is oxygen or $H(OR_3)$ wherein R_3 is hydrogen, an acyl group of a C_{1-17} optionally substituted, hydrocarbon carboxylic or sulfonic acid, C_{1-5} alkyl, C_{1-5}-alkenyl, C_{1-5}-alkyl or C_{1-5} alkenyl interrupted by an oxa atom, cyclopentyl or tetrahyropyranyl.

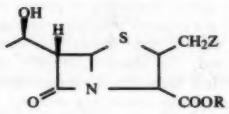
6. A pharmaceutical composition comprising an antiandrogenically topically effective amount of a composition of claim 1 and a pharmaceutically acceptable carrier for topical formulations.

4,558,042
β-LACTAM-CONTAINING ANTIBACTERIAL AGENTS AND β-LACTAMASE INHIBITORS

Maurizio Foglio; Giovanni Franceschi; Cosimo Scarafile; Federico Arcamone, and Aurora Sanfilippo, all of Milan, Italy, assignors to Farmitalia Carlo Erba S.p.A., Milan, Italy

Continuation of Ser. No. 261,247, May 6, 1981, Pat. No. 4,482,565, which is a continuation-in-part of Ser. No. 123,787, Feb. 22, 1980, abandoned, which is a continuation-in-part of Ser. No. 66,333, Aug. 14, 1979, abandoned. This application Mar. 30, 1984, Ser. No. 595,336
Int. Cl.[4] C07D *499/00*; A61K *31/425*
U.S. Cl. 514—192 **6 Claims**

1. A compound of the formula:



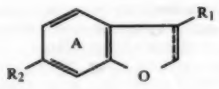
wherein R is a hydrogen atom, C_1-C_6-alkyl; 2,2,2-trichloroethyl p-nitrobenzyl, acetonyl, or acetoxymethyl; Z is selected from the group consisting of pyridinium, and $OCOC_1$—C_6-alkyl, and a pharmaceutically acceptable salt thereof.

4,558,043
HETEROCYCLICAMINO CONTAINING BENZOFURANS AND 2,3-DIHYDROBENZOFURANS, COMPOSITIONS AND USE

Paul Wenk, Allschwil; Werner Breitenstein, and Marcus Baumann, both of Basel, all of Switzerland, assignors to Ciba Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 536,585, Sep. 28, 1983, abandoned. This application Jul. 11, 1984, Ser. No. 628,970
Claims priority, application Switzerland, Oct. 8, 1982, 5926/82; Apr. 22, 1983, 2177/83
Int. Cl.[4] A61K *31/535, 31/54*; C07D *413/02, 417/02*
U.S. Cl. 514—210 **22 Claims**

1. Benzofurans or 2,3-dihydrobenzofurans of the formula



(I)

in which
R_1 represents hydrogen or an aliphatic radical,
R_2 represents an amino group disubstituted by a bivalent aliphatic radical which is optionally interrupted by at least one hetero atom,
and the aromatic ring
A may be additionally substituted,
and the salts thereof.

21. A pharmaceutical preparation comprising an analgesic or anti-inflammatory amount of a compound according to claim 1 and a pharmaceutically acceptable carrier.

4,558,044

1,2,4-BENZOTHIADIAZINES

Francis D. King, Newport, England, assignor to Beecham Group p.l.c., Brentford, England

Filed Sep. 29, 1983, Ser. No. 537,035

Claims priority, application United Kingdom, Feb. 19, 1983, 8304645; Jul. 28, 1983, 8320326

Int. Cl.[4] **A61K** *31/54;* **C07D** *417/14, 417/12*

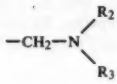
U.S. Cl. 514—222 **15 Claims**

1. A compound of formula (I), or a pharmaceutically acceptable salt, quaternised derivative, N-oxide or solvate thereof:

$$R_1—Ar—(CH_2)_a—X—(CH_2)_b—NH—Het \quad (I)$$

wherein:

R_1 is guanidino, any amino moiety being optionally substituted by one or two C_{1-4} alkyl optionally substituted by halogen, or an aminomethylene group of formula (a),



(a)

in which R_2 and R_3 are the same or different and are hydrogen, C_{1-4} alkyl, C_{3-6} cycloalkyl, C_{3-6} cycloalkyl-C_{1-4} alkyl or phenyl C_{1-4} alkyl, or R_2 and R_3 together with the nitrogen atom to which they are attached are morpholino, pyrrolidino or piperidino;

Ar is furandiyl, thiophendiyl, phenylene, pyridinediyl, pyrimidinediyl, thiazolediyl, thiadiazolediyl or imidazolediyl;

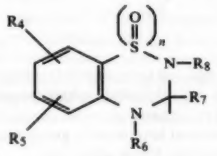
a is O or an integer 1 or 2;

X is —S—, —O—, $—CH_2—$,

or —NH—;

b is an integer from 2 to 5; and

Het is a bicyclic heteroaryl group of formula,



in which R_4 and R_5 are the same or different and are hydrogen, halogen, C_{1-6} alkyl, trifluoromethyl, nitro, cyano, hydroxy, C_{1-6} alkoxy, C_{1-6} alkylthio, carboxy, amino, aminocarbonyl, aminocarbonylamino, amino-thiocarbonylamino, aminosulphonyl, C_{1-6} alkylsulphonyl, C_{1-6} alkylsulphinyl, C_{1-6} alkylsulphonylamino, C_{1-6} alkylsulphinylamino, phenylsulphonyl, phenylsulphinyl or are a group of formula (d) or (e),

$$R_9—CY— \quad (d) \qquad R_9—CY—Z— \quad (e)$$

in which R_9 is hydrogen, C_{1-6} alkyl, C_{1-6} alkoxy, C_{1-6} alkylthio, phenyl, phenoxy or phenylthio, Y is oxygen or sulphur and Z is oxygen, sulphur or $N—R_{10}$, R_{10} being hydrogen or C_{1-6} alkyl, the C_{1-6} alkyl group or the C_{1-6} alkyl moiety of any of the foregoing C_{1-6} alkyl-containing groups for R_4 and R_5 being optionally substituted by phenyl, the amino group or the amino moiety of any of the foregoing amino-containing groups for R_4 and R_5 being optionally substituted by one or two C_{1-6} alkyl, phenyl or phenyl-C_{1-4} alkyl or optionally N-disubstituted by C_{4-5} polymethylene, and the phenyl moiety of any of the foregoing phenyl-containing groups for R_4 and R_5 being optionally substituted by C_{1-6} alkyl, C_{1-6} alkoxy, nitro or trifluoromethyl, one of R_6 and R_8 is hydrogen, C_{1-6} alkyl, C_{1-6} alkanoyl, C_{1-6} alkylsulphonyl, C_{1-6} alkoxycarbonyl or phenoxycarbonyl, benzyloxycarbonyl, phenyl, phenylsulphonyl or phenyl C_{1-4} alkyl, the phenyl moiety being optionally substituted by benzoyl, C_{1-6} alkyl, C_{1-4} alkoxy, halogen, nitro or trifluoromethyl, and the other of R_6 and R_8 together with R_7 is a bond, and n is O or an integer 1 or 2.

4,558,045

1,3,4-THIADIAZIN-2-ONES

Rodney B. Hargreaves, Poynton; Bernard J. McLoughlin, and Stuart D. Mills, both of Macclesfield, all of England, assignors to Imperial Chemical Industries, PLC, London, England

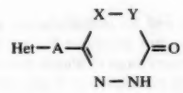
Division of Ser. No. 438,728, Nov. 3, 1982, Pat. No. 4,489,073. This application Oct. 12, 1984, Ser. No. 660,102

Claims priority, application United Kingdom, Nov. 12, 1981, 8134174

Int. Cl.[4] **C07D** *409/04;* **A61K** *31/54;* **C07D** *409/06, 417/04*

U.S. Cl. 514—222 **19 Claims**

1. A heterocyclic compound of the formula:



wherein A is a direct link, or is alkylene of 1 to 4 carbon atoms or alkenylene of 2 to 4 carbon atoms; wherein X is $—CR^1R^2$ and Y is —S— wherein R^1 and R^2, which may be the same of different, each is hydrogen or alkyl of up to 4 carbon atoms; and wherein Het is pyridyl, thienyl, furyl, pyrrolyl, pyrimidinyl, thiazolyl, imidazolyl, indolyl, benzothienyl, benzofuryl, quinolyl, isoquinolyl or quinoxalinyl which may be unsubstituted or may bear one or two substituents selected from: —halogen, cyano, nitro, trifluoromethyl; amino, alkylamino and dialkylamino wherein the one or two alkyls each is of up to 4 carbon atoms;

alkyl and alkoxy each of up to 4 carbon atoms;

hydroxy, oxo (if on carbon next to nitrogen) and oxy (if on nitrogen or sulphur);

substituents of the formula

$$—CZOR^6$$

$$—CZNR^7R^8$$

$$—SO_2R^7R^8$$

wherein Z is oxygen or sulphur and wherein R^6, R^7 and R^8, which may be the same or different, each is hydrogen, alkyl, alkenyl, cycloalkyl or alkoxyalkyl each of up to 6 carbon atoms, or aryl or arylalkyl each of up to 12 carbon atoms, or wherein R^7 and R^8 together with the adjacent nitrogen atom form a 5- or 6-membered fully-saturated heterocyclic ring;

provided that when A is a direct link, Het is not unsubstituted 2-furyl;

or a salt thereof where appropriate.

4,558,046
SUBSTITUTED CARBOXY-THIAZOLO [3,2-A] PYRIMIDINE DERIVATIVES AND PROCESS FOR THEIR PREPARATION

Gianfederico Doria, Milan; Carlo Passarotti, Gallarate, and Maria L. Corno, Milan, all of Italy, assignors to Farmitalia Carlo Erba, S.p.A., Milan, Italy

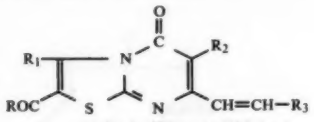
Filed Jan. 11, 1984, Ser. No. 569,963

Claims priority, application United Kingdom, Jan. 28, 1983, 8300728

Int. Cl.⁴ C07D *413/12*; A61K *27/00*

U.S. Cl. 514—227 **3 Claims**

1. A method of producing an anti-allergic effect in a patient in need of such effect, said method comprising administering to said patient an anti-allergic effective amount of a compound of the formula (I)



(I)

wherein

R is

(a) hydroxy;

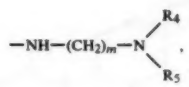
(b) a C_1–C_6 alkoxy group unsubstituted or substituted by an unsubstituted 3-pyridyl ring or by a

group, wherein each of R_4 and R_5 independently is a hydrogen atom or a C_1–C_6 alkyl group, or R_4 and R_5, taken together with the nitrogen atom to which they are linked, form an unsubstituted piperidino or N-pyrrolidinyl ring, or a morpholino ring unsubstituted or substituted by one or two C_1–C_4 alkyl groups, or a N-piperazinyl ring unsubstituted or substituted by a substituent chosen from C_1–C_6 alkyl, 2-pyridyl and phenyl;

(c)

wherein R_4 and R_5 are as defined above;

(d)



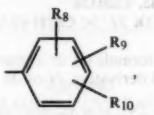
wherein m is 1, 2 or 3 and R_4 and R_5 are as defined above; or

(e) $—NR_6—(CH_2)_n—R_7$, wherein R_6 is hydrogen or C_1–C_6 alkyl, n is zero, 1, 2 or 3 and R_7 is an unsaturated heterocyclic ring selected from the group consisting of 2-pyridyl, thiazolyl and tetrazolyl, unsubstituted or substituted by one or two substituents chosen from halogen, C_1–C_6 alkyl and C_1–C_6 alkoxy;

R_1 is a hydrogen atom, C_1–C_6 alkyl, an unsubstituted 3-pyridyl ring or a phenyl ring unsubstituted or substituted by one or two substituents chosen from halogen, C_1–C_6 alkyl and C_1–C_6 alkoxy;

R_2 is a hydrogen or a halogen atom or a C_1–C_4 alkyl group;

R_3 is a thienyl or a 2-, 3- or 4-pyridyl ring, each of which is unsubstituted or substituted by C_1–C_6 alkyl; or R_3 is a group of formula



wherein each of R_8, R_9 and R_{10} independently represents hydrogen, halogen, hydroxy, formyloxy, C_2–C_4 alkanoyloxy, nitro, amino, formylamino, C_2–C_4 alkanoylamino, trihalo-C_1–C_6-alkyl or a $—(O)_p—R_{11}$ group, wherein p is zero or 1 and R_{11} represents a C_1–C_6 alkyl or C_3–C_4 alkenyl group, with the proviso that no more than two of said groups R_8, R_9 and R_{10} may be nitro, and the pharmaceutically acceptable salts thereof.

4,558,047
3,5-DI HYDROXY MORPHOLINE DERIVATIVES AND PHARMACEUTICAL COMPOSITIONS

Takao Takaya, Kawanishi, and Zenzaburo Tozuka, Toyonaka, both of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

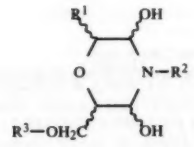
Filed Apr. 10, 1984, Ser. No. 598,581

Claims priority, application United Kingdom, Apr. 25, 1983, 8311228

Int. Cl.⁴ A61K *31/535, 413/14*

U.S. Cl. 514—229 **18 Claims**

1. A compound of the formula:



wherein

R^1 is a heterocyclic group selected from uracilyl, cytosinyl, hypoxanthinyl, adeninyl and thiazolyl, which may be substituted with halogen or carbamoyl,

R^2 is an N-containing unsaturated heterocyclic group which may be substituted with oxo or lower alkyl, and

R^3 is a hydrogen atom or a phosphono group,

and pharmaceutically acceptable salts thereof.

18. A pharmaceutical composition comprisng a compound of claim **1**, as an effective ingredient, in association with a pharmaceutically acceptable, substantially nontoxic carrier or excipient.

4,558,048
METHOD OF TREATING DIARRHOEA USING INDOLE COMPOUNDS

Robert J. Bass, Birchington, England, assignor to Pfizer Inc., New York, N.Y.

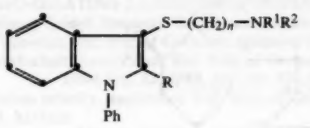
Filed Mar. 27, 1985, Ser. No. 716,773

Claims priority, application United Kingdom, Apr. 6, 1984, 8408913; Jan. 26, 1985, 8501983

Int. Cl.⁴ A61K *31/40, 31/445, 31/495, 31/535*

U.S. Cl. 514—232 **10 Claims**

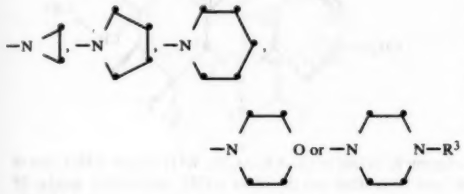
1. A method for the treatment of diarrhoea in a patient, which comprises administering to said patient an effective amount of a substituted phenylindole of the formula:



(I)

or a pharmaceutically-acceptable acid addition salt thereof;

wherein R is hydrogen, chloro, bromo, —CH(OH).Ph or —CH(OH).cyclohexyl; each Ph is phenyl or substituted phenyl; n is an integer of from 2 to 7; and each of R^1 and R^2 is hydrogen or (C_1–C_4) alkyl, or R^1 and R^2 taken together with the nitrogen atom to which they are attached form heterocyclic group of the formula:



where R^3 is hydrogen or (C_1–C_4) alkyl.

4,558,049

ANTIPSYCOTIC BENZOXAZINES

Luigi Bernardi; Ettore Lazzari, both of Milan; Maria L. Malnati, Nese; Giuseppe Mazzini, Milan; Lorenzo Pegrassi, Milan, and Alessandro Rossi, Milan, all of Italy, assignors to Farmitalia Carlo Erba S.p.A., Milan, Italy

Filed May 11, 1983, Ser. No. 493,618

Claims priority, application United Kingdom, Nov. 24, 1982, 8233533

Int. Cl.⁴ A61K *31/535;* **C07D** *498/10*

U.S. Cl. 514—234 **3 Claims**

1. A compound of the formula 1'-[3-(4-fluorobenzoyl)-propyl]spiro-(3,1-benzoxazine-6-bromo-4(2H)4'-piperidin)-2-one, or a pharmaceutically-acceptable salt thereof.

3. A method for treating psychotic disorders in humans comprising administering to a subject in need of such treatment an antipsychotic effective amount of the compound of claim 1.

4,558,050

TREATMENT OF METABOLIC DISORDERS WITH DICHLOROACETATE-THIAMINE PREPARATIONS

Peter W. Stacpoole, Gainesville, Fla., assignor to University of Florida, Gainsville, Fla.

Filed Mar. 1, 1984, Ser. No. 584,994

Int. Cl.⁴ A61K *31/505;* **C07D** *239/02, 415/00*

U.S. Cl. 514—252 **30 Claims**

1. The chemical compound formed by the reaction between thiamine or a pharmaceutically active derivative thereof and a dichloroacetic acid.

15. A method for the treatment of a metabolic disease comprising administering to a lower animal or human in need thereof a therapeutically effective amount of the compound of claim 1 or a salt of a pharmaceutically acceptable cation and dichloroacetic acid and an amount of thiamine or a pharmaceutically active derivative thereof necessary to reduce the toxicity to said lower animal or human of said compound or said salt.

4,558,051

ANALGESIC AND ANTI-INFLAMMATORY COMPOSITIONS COMPRISING XANTHINES AND METHODS OF USING SAME

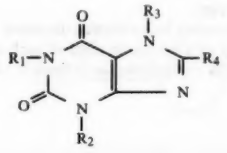
Abraham Sunshine, New York; Eugene M. Laska, Larchmont, and Carole E. Siegel, Mamaroneck, all of N.Y., assignors to Richardson-Vicks, Inc., Wilton, Conn.

Continuation-in-part of Ser. No. 541,010, Oct. 11, 1983, Pat. No. 4,464,376, which is a continuation of Ser. No. 400,597, Jul. 22, 1982, abandoned, and Ser. No. 400,645, Jul. 22, 1982, Pat. No. 4,420,483. This application Dec. 12, 1983, Ser. No. 560,576

Int. Cl.⁴ A61K *31/52, 31/44, 31/19*

U.S. Cl. 514—261 **54 Claims**

1. A pharmaceutical composition of matter adapted to elicit an onset hastened and enhanced analgesic and anti-inflammatory response in a mammaliam organism in need of such treatment, said composition comprising an analgesically and anti-inflammatory effective amount of an active drug component and an active drug potentiating adjuvant therefor, said active drug comprising ibuprofen, naproxen, fenoprofen, indoprofen, diflunisal or pharmaceutically acceptable salts thereof and said adjuvant comprising an active drug analgesic and anti-inflammatory onset hastening and enhancing amount of a xanthine derivative of the formula

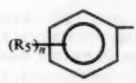


(I)

or a pharmaceutically acceptable non-toxic salt thereof wherein

R_1–R_3, inclusive, independently represent hydrogen, C_1–C_6alkyl, C_1–C_6alkoxy, C_1–C_6haloalkyl, C_3–C_6cycloalkyl, hydroxy(C_1–C_6)alkyl, halogen, hydroxy(C_1–C_4)alkylamino(C_1–C_4)alkyl, C_1–C_4(dialkyl) amino(C_1–C_4)alkyl, C_1–C_4alkylcarbonyl (C_1–C_4)alkyl, C_1–C_6alkylamino, C_1–C_6(dialkyl-)amino, indolyl, phenyl or allyl;

R_4 is hydrogen, C_1–C_6alkyl, halo(C_1–C_6) alkyl, C_1–C_6alkylamino, C_1–C_6alkylthio, nitro, carboxy C_1–C_6(dialkyl-)amino, C_3–C_6cycloalkyl, phenyl, naphthyl, ar(C_1–C_4)alkyl, or a group of the formula



(II)

where R_5 is halo, C_1–C_6alkyl, C_1–C_6 alkoxy, C_1–C_6alkylthio, notro or C_1–C_6alkylamino and n is 1, 2 or 3, with the proviso that R_1, R_2 and R_3 cannot all be C_1alkyl when R_4 is hydrogen

4,558,052

10-BROMOSANDWICINE, 10-BROMOISOSANDWICINE, PHARMACEUTICAL COMPOSITIONS THEREOF, AND METHODS OF TREATING HEART RHYTHM DISORDERS WITH THEM

Wolfgang Kehrbach, Hanover, and Joachim Wegener, Algermissen, both of Fed. Rep. of Germany, assignors to Kali-Chemie Pharma GmbH, Hanover, Fed. Rep. of Germany

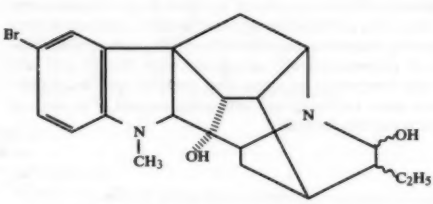
Continuation-in-part of Ser. No. 396,351, Jul. 8, 1982, which is a continuation of Ser. No. 195,618, Oct. 9, 1980, abandoned. This application Jun. 8, 1984, Ser. No. 618,908

Claims priority, application Fed. Rep. of Germany, Oct. 13, 1979, 2941531

Int. Cl.[4] A61K *31/435;* **C07D** *455/00, 471/08*

U.S. Cl. 514—279 **5 Claims**

1. A compound of the formula I



(I)

and acid addition salts thereof.

4. A pharmaceutical composition comprising an effective amount of 10-bromosandwicine, 10-bromoisosandwicine or pharmacologically acceptable acid addition salts thereof and a pharmaceutical carrier.

5. A method of treating heart rhythm disorders which comprises administering to a patient in need of such treatment an effective amount of a composition as defined in claim **4**.

4,558,053

NAPHTHALENE-1,5-DISULFONATE SALTS OF DIMERIC INDOLE-DIHYDROINDOLE ALKALOIDS

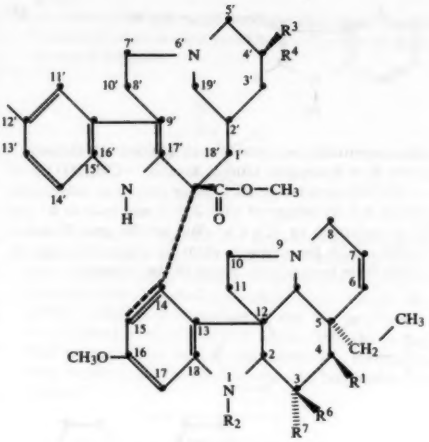
Stanislaw Rolski, and Ralph R. Pfeiffer, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Dec. 21, 1983, Ser. No. 564,119

Int. Cl.[4] A61K *31/475;* **C07D** *519/04*

U.S. Cl. 514—283 **8 Claims**

1. A 1,5-naphthalenedisulfonate salt of an indole-dihydroindole alkaloid of the formula



1

wherein R^1 is OH or O—CO—CH_3, R^2 is CH_3 or CHO; one of R^3 and R^4 is ethyl and the other is OH; when taken singly, R^6 is OH and R^7 is CO—OCH_3 or CO—R^9, wherein R^9 is NH_2, NH—C_{1-3} alkyl-X, wherein X is hydrogen, chloro or bromo, or C_{1-3} loweralkanoyloxy; when R^6 and R^7 are taken together with the carbon atoms to which they are attached, they form a spiro-oxazolidinedione ring permissibly substituted at N_3'' with C_{1-3} alkyl or chloro-substituted C_{1-3} alkyl.

4,558,054

SPASMOLYTIC ENDO-8,8-DIALKYL-8-AZONIABICYCLO (3.2.1) OCTANE-6,7-EXO-EPOXY-3-ALKYL-CARBOXYLATE SALTS

Virgilio Bernareggi; Fausto Bonifacio; Roberto Margutti, and Maurizio Fano, all of Milan, Italy, assignors to Valeas S.p.A., Milan, Italy

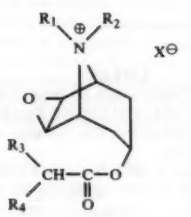
Filed Jul. 6, 1984, Ser. No. 628,398

Claims priority, application Italy, Jul. 26, 1983, 22238 A/83

Int. Cl.[4] C07D *491/10;* **A61K** *31/655*

U.S. Cl. 514—291 **4 Claims**

1. Endo-8,8-dialkyl-8-azoniabicyclo[3.2.1]octane-6,7-exo-epoxy-3-alkylcarboxylate compounds of formula



(I)

in which

R_1 and R_2, which can be the same or different, are linear or branched alkyl radicals of 1–5 carbon atoms or cycloalkyl radicals of 3–6 carbon atoms;

R_3 and R_4, which can be the same or different, are linear or branched alkyl radicals of 1–6 carbon atoms;

X is Br, Cl or I.

4. A therapeutic composition comprising: a spasmolytically effective amount of the compound of formula (I), as defined in claim **1**, and a pharmaceutically acceptable carrier.

4,558,055

VASO-DILATING 1,4-DIHYDROPYRIDINE LACTAMS

Wolfgang Seidel; Stanislav Kazda, and Andreas Knorr, all of Wuppertal, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

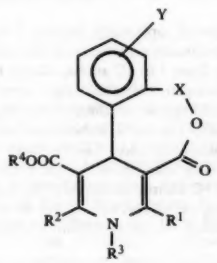
Filed Sep. 12, 1983, Ser. No. 531,361

Claims priority, application Fed. Rep. of Germany, Sep. 23, 1982, 3235221

Int. Cl.[4] C07D *491/044, 491/056;* A61K *31/455*

U.S. Cl. 514—291 **12 Claims**

1. A 1,4-dihydropyridine of the formula



in which

Y represents nitro, cyano, trifluoromethyl, trifluoromethoxy, fluorine, chlorine, bromine, azido, alkoxy with up to 4 carbon atoms or O-benzyl,

X represents a straight-chain or branched alkyl chain which has up to 12 carbon atoms, is linked to its phenyl ring directly or via an oxygen or sulphur atom and can optionally be interrupted by one or two oxygen atoms,

R^4 denotes a straight-chain or branched alkyl radical which has 1 to 8 carbon atoms and is optionally substituted by an alkoxy group with up to 4 carbon atoms, by a cyano group, a fluorine group or a chlorine group or by an amino group, which is in turn monosubstituted by alkyl with 1 to 4 carbon atoms and carries, as the third substituent, an identical or different alkyl group with 1 to 4 carbon atoms or a benzyl radical,

R^1 and R^2 are identical or different and each represent hydrogen or alkyl with 1 or 2 carbon atoms and

R^3 represents hydrogen, alkyl with up to 4 carbon atoms or benzyl,

or a pharmaceutically acceptable acid addition salt thereof.

9. A blood pressure lowering, anti-fibrillar and anti-spasmolytic composition comprising an amount effective therefor of a compound or salt according to claim **1** in admixture with a diluent.

4,558,056

ANALGESIC 3-(4-PIPERIDINYL)-1,2-BENZISOTHIAZOLES

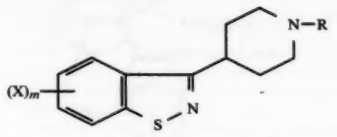
Joseph T. Strupczewski, Flemington, N.J., assignor to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

Division of Ser. No. 499,583, May 31, 1983, Pat. No. 4,458,076. This application Apr. 23, 1984, Ser. No. 603,004

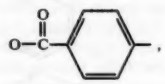
Int. Cl.[4] A61K *31/445*

U.S. Cl. 514—321 **2 Claims**

1. A method of alleviating pain comprising administering to a mammal in need of pain alleviation a pain-alleviating, effective amount of a compound of the formula

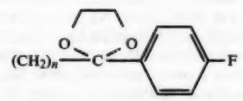


wherein R is hydrogen, loweralkyl, loweralkenyl, lowercycloalkylloweralkyl, phenylloweralkyl, hydroxy, diloweralkylaminoloweralkyl, cyano, cyanomethyl,

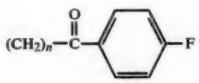


a group of the formula

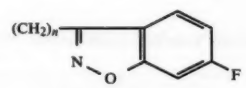
wherein R^1 is hydrogen, loweralkyl or a group of the formula OR^2 wherein R^2 is phenyl or benzyl; a group of the formula



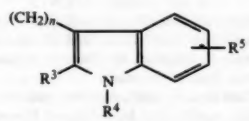
wherein n is 2 or 3; a group of the formula



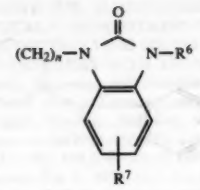
wherein n is 2 or 3; a group of the formula



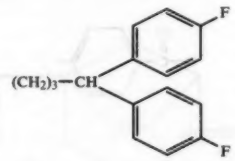
wherein n is 2 or 3; a group of the formula



wherein R^3 and R^4 are each independently hydrogen or loweralkyl, R_5 is hydrogen, halogen or loweralkyl, and n is 2 or 3; a group of the formula



wherein R^6 is hydrogen or loweralkyl, R^7 is hydrogen, halogen or loweralkyl, and n is 2 or 3; or a group of the formula



X is hydrogen, halogen, loweralkyl, loweralkoxy or hydroxy; and m is 1 or 2; an optical antipode thereof; or a pharmaceutically acceptable acid addition salt thereof.

4,558,057

PURIFIED ANTINEOPLASTON FRACTIONS AND METHODS OF TREATING NEOPLASTIC DISEASE

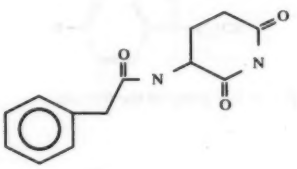
Stanislaw R. Burzynski, #5 Concord Cir., Houston, Tex. 77024

Continuation of Ser. No. 330,383, Dec. 15, 1981, Pat. No. 4,470,970, which is a continuation-in-part of Ser. No. 279,728, Jul. 2, 1981, abandoned. This application Aug. 20, 1984, Ser. No. 642,499

Int. Cl.[4] A61K *37/00;* **C07D** *211/40*

U.S. Cl. 514—328 **15 Claims**

1. A composition of matter consisting essentially of:



or pharmaceutically acceptable salts thereof.

4,558,058

SUBSTITUTED 1,4-DIHYDROPYRIDINES AND THEIR USE AS MEDICAMENTS

Karl Schönafinger, Alzenau; Helmut Bohn; Melitta Just, both of Schöneck, and Piero Martorana, Bad Homburg, all of Fed. Rep. of Germany, assignors to Cassella Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

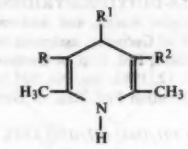
Filed Dec. 9, 1983, Ser. No. 560,197

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1982, 3247118

Int. Cl.[4] C07D *413/04;* **A61K** *31/44*

U.S. Cl. 514—342 **26 Claims**

1. A substituted 1,4-dihydropyridine of formula I



(I)

in which

R denotes $—CO_2R^3$, cyano or one of the meanings indicated under R^2;

R^1 denotes phenyl, optionally having 1 or 2 identical or different substituents selected from the group consisting of alkyl having from 1 to 4C atoms, alkoxy having from 1 to 4C atoms, halogen, trifluoromethyl, nitro or cyano;

R^2 denotes oxadiazolyl or thiadiazolyl each 5-membered ring optionally having 1 substituent selected from the group consisting of alkyl having from 1 to 4C atoms, alkylthio having from 1 to 4C atoms, aralkyl having a total of from 7 to 9C atoms, alkoxyalkyl having a total of from 2 to 5C atoms, cycloalkyl having 5 or 6C atoms, aminocarbonylmethylthio, methoxycarbonyl, ethoxycarbonyl and phenyl;

R^3 denotes alkyl having from 1 to 6C atoms, alkoxyalkyl having from 3 to 8C atoms, dialkylaminoalkyl having a total of from 4 to 9 C atoms, N-aralkyl-N-alkylaminoalkyl having a total of from 10 to 14C atoms or cycloalkyl having 5 or 6C atoms;

or an acid-addition salt thereof.

4,558,059

2-SUBSTITUTED-PHENYLTHIAZOLE DERIVATIVES

Takao Kawasaki, Sayama; Daisaku Immaru, Tama; Tadashi Tsuchiya, Matsudo; Yukiharu Yamaguchi, Tokyo, and Katsumi Komatsu, Matsudo, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Nihonbashi, Japan

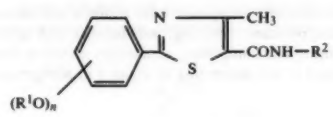
Continuation of Ser. No. 309,186, Oct. 7, 1981, abandoned. This application Nov. 14, 1984, Ser. No. 671,067

Claims priority, application Japan, Oct. 24, 1980, 55-149200

Int. Cl.[4] A61H *31/425;* **C07D** *277/56*

U.S. Cl. 514—371 **4 Claims**

1. A derivative of 2-substituted-phenylthiazole having the formula (I):



(I)

wherein R^1 represents a lower alkyl group of 1 to 3 carbon atoms, R^2 represents a hydrogen atom or a lower alkyl group of 1 to 3 carbon atoms and n denotes an integer of 1 to 3, with the proviso that when R^2 represents a hydrogen atom the positions 3, 4 and 5 of benzene ring thereof are not simultaneously occupied by methoxy group.

4,558,060

BENZOXAZOLINONES

Daniel H. Caignard, Chamalieres; Charles Lespagnol, Lambersart; Daniel Lesieur, Gondecourt, and Norbert Busch, Manzat, all of France, assignors to Riom Laboratories - Cerm S.A., Riom, France

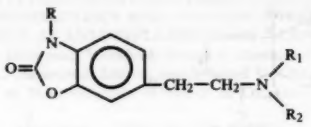
Filed Nov. 22, 1983, Ser. No. 554,194

Claims priority, application France, Nov. 25, 1982, 82 19812

Int. Cl.[4] C07D *263/58;* **A61K** *31/42*

U.S. Cl. 514—375 **5 Claims**

1. A compound of the formula:



in which R represents hydrogen or a lower alkyl radical and R_1 and R_2 separately represent hydrogen, and pharmaceutically acceptable salts thereof.

4,558,061

BRONCHOSPASMOLYTIC 1-(3-METHANESULFONAMIDO-4-HYDROXYPHENYL)-2-[(3-(4-ACYL-AMINOPHENYL)-IMIDAZOLIDIN-2-ONE-1-YL)-ALKYLAMINO]-ETHANOLS

Anton Mentrup, Mainz-Kastel; Kurt Schromm, Ingelheim am Rhein; Ernst-Otto Renth, Ingelheim am Rhein; Gojko Muacevic, Ingelheim am Rhein, and Armin Fügner, Gau-Algesheim, all of Fed. Rep. of Germany, assignors to Boehringer Ingelheim KG, Ingelheim am Rhein, Fed. Rep. of Germany

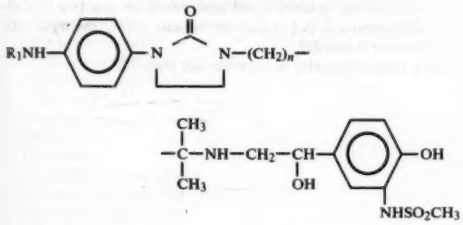
Filed Jul. 6, 1984, Ser. No. 628,383

Claims priority, application Fed. Rep. of Germany, Jul. 18, 1983, 3325875

Int. Cl.[4] A61K *31/415;* **C07D** *233/36*

U.S. Cl. 514—392 **6 Claims**

1. A compound of the formula



wherein n is 1 or 2,

R_1 is —CO—R_2 or —SO_2R_3,

R_2 is hydrogen, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms or (alkyl of 1 to 4 carbon atoms) amino, and

R_3 is alkyl of 1 to 4 carbon atoms, an enantiomer thereof, or a nontoxic, pharmacologically acceptable acid addition salt thereof.

6. The method of checking bronchospasms in a warm-blooded animal in need thereof, which comprises perorally, parenterally or rectally administering to said animal an effective bronchospasmolytic amount of a compound of claim 1.

4,558,062

DIPHENYLAZOMETHINES BEARING AN IMIDAZOLYL GROUP AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Jean-Pierre Kaplan, Bourg la Reine, France, assignor to Synthelabo, Paris, France

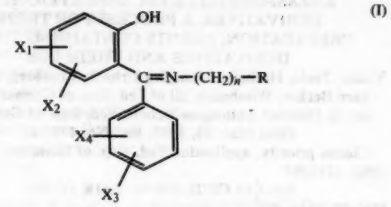
Filed Jun. 29, 1984, Ser. No. 626,298

Claims priority, application France, Jul. 1, 1983, 83 10974

Int. Cl.[4] A61K *31/415;* **C07D** *233/64*

U.S. Cl. 514—400 **6 Claims**

1. A diphenylazomethine of the formula



(I)

in which X_1, X_2, X_3 and X_4, are independently selected from hydrogen and halogen atoms and nitro, cyano, hydroxy, methoxy, C_1–C_3-alkyl, allyl and phenyl groups, and either R represents a 2-(1H-imidazolyl) radical and n is 1 or R represents a 4-(1H-imidazolyl) radical and n is 1 or 2.

4. A pharmaceutical composition for treating depression comprising an antidepressant effective amount of a diphenylazomethine of claim 1 and a pharmaceutically acceptable excipient.

4,558,063

TREATMENT OF DIARRHOEA WITH 2-AMINOIMIDAZOLINE DERIVATIVES

Lee J. Beeley, Westcott, and Peter M. Newsome, Worcester Park, both of England, assignors to Beecham Group p.l.c., England

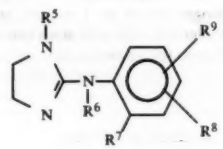
Filed Feb. 27, 1984, Ser. No. 584,015

Claims priority, application United Kingdom, Jul. 9, 1980, 8022407; Feb. 20, 1981, 8105339

Int. Cl.[4] A61K *31/415;* **C07D** *233/46, 233/48*

U.S. Cl. 514—402 **10 Claims**

6. A method for treating diarrhoea in animals, including man, which comprises administering an effective, non-toxic amount of a compound of formula (II):



(II)

wherein

R^5 is selected from hydrogen, (C_{1-4})alkyl and carboxylic acid acyl;

R^6 is selected from hydrogen, (C_{1-4})alkyl and carboxylic acid acyl;

R^7 is selected from hydroxy, halogen, (C_{1-4})alkyl, (C_{1-4})alkoxy and a group R^8;

R^8 is an ortho or para substituent selected from aminomethyl, mono- or di-(C_{1-4})alkylaminomethyl, amidino, or 2-imidazolidinylimino optionally substituted on a nitrogen atom with (C_{1-4})alkyl or carboxylic acid acyl;

R^9 is selected from hydroxy, halogen, (C_{1-4})alkoxy, hydrogen and a group R^8 when in the para position or R^9 is selected from hydroxy, halogen, (C_{1-4})alkyl, and (C_{1-4})alkoxy when in a meta position,

or R^9 is selected from hydroxy, halogen, (C_{1-4})alkyl, (C_{1-4})alkoxy and a group R^8 when in the ortho position,

or a pharmaceutically acceptable salt thereof to an animal, including man, suffering from diarrhoea.

4,558,064

2-AZASFIRO[4.(3+n)]-3-CARBOXYLIC ACID DERIVATIVES, A PROCESS FOR THEIR PREPARATION, AGENTS CONTAINING THESE DERIVATIVES AND THEIR USE

Volker Teetz, Hofheim; Hansjörg Urbach, Kronberg, and Reinhard Becker, Wiesbaden, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

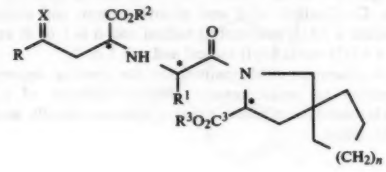
Filed Mar. 25, 1983, Ser. No. 478,780

Claims priority, application Fed. Rep. of Germany, Mar. 27, 1982, 3211397

Int. Cl.[4] C07D *209/96;* **A61K** *31/395*

U.S. Cl. 514—409 **9 Claims**

1. A compound of the formula I



in which

n denotes 1, 2, 3 or 4,

R denotes (C_1–C_6)-alkyl, (C_2–C_6)-alkenyl, (C_5–C_9)-cycloalkyl, (C_6–C_{12})-aryl, optionally mono-, di- or trisubstituted by (C_1–C_4)-alkyl, (C_1–C_4)-alkoxy, hydroxy, halogen, nitro, amino, (C_1–C_4)-alkylamino, di-(C_1–C_4)-alkylamino or methylenedioxy or indol-3-yl,

R^1 denotes a side-chain of an amino acid selected from the group consisting of Ala, Ser, Thr, Val, Leu, Ile, Asp, Asp-NH2, Glu, Glu-NH2, Cys, Met, Arg, Lys, Hyl, Orn, Cit, Tyr, Phe, Trp and His, a side chain of Lys, Hyl or Orn, the amino group of which is protected by (C_1–C_6)-alkanoyl, or Ser, Thr, Hyl or Tyr, the hydroxyl group of which is protected by alkyl,

R^2 denotes hydrogen, alkyl having 1 to 6 C atoms or optionally nitro-substituted aralkyl having 7 to 9 C atoms,

R^3 denotes hydrogen, alkyl having 1 to 10 C atoms, cycloalkyl having 3 to 10 C atoms or optionally nitro-substituted aralkyl having 7 to 9 C atoms and

X denotes 2 hydrogen atoms or 1 oxygen atom, and its physiologically tolerated salts with acids and, if R^2 and/or R^3 denote hydrogen, with bases.

4,558,065

DERIVATIVES OF TRICYCLIC AMINOACIDS, PROCESSES FOR THEIR PREPARATION, AGENTS CONTAINING THESE COMPOUNDS AND THEIR USE, AND NEW BICYCLIC AMINOACIDS AS INTERMEDIATES AND PROCESSES FOR THEIR PREPARATION

Hansjörg Urbach, Kronberg; Rainer Henning, Frankfurt am Main, and Reinhard Becker, Wiesbaden, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

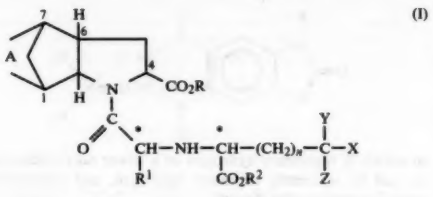
Filed Nov. 10, 1983, Ser. No. 550,531

Claims priority, application Fed. Rep. of Germany, Nov. 13, 1982, 3242151

Int. Cl.[4] A61K *37/00;* **C07C** *103/52*

U.S. Cl. 514—412 **10 Claims**

1. A compound of the formula I



(I)

in which

n denotes 0 or 1;

A denotes —CH=CH- or —CH_2—CH_2—;

R denotes hydrogen; (C_1 to C_6)-alkyl or aralkyl with 7 to 9 carbon atoms;

R^1 denotes hydrogen;

($C_1$to C_6)-alkyl; or

a side chain of a naturally occurring aminoacid selected from the group consisting of Ser, Thr, Asp, Asn, Glu, Gln, Arg, Lys, Hyl, Cys, Orn, Cit, Tyr, Trp, His, Hyp and Ala; or a side chain of said naturally occurring amino acid protected by a protective group;

R^2 denotes hydrogen; (C_1 to C_6)-alkyl; (C_2 to C_6)-alkenyl; or (C_6 to C_{12})-aryl-(C_1 to C_4)-alkyl;

Y denotes hydrogen or hydroxyl; and

Z denotes hydrogen; or

Y and Z together denote oxygen; and

X denotes (C_1 to C_6)-alkyl; (C_2 to C_6)-alkenyl; (C_5 to C_9)-cycloalkyl; or (C_6 to C_{12})-aryl; or such (C_6 to C_{12})-aryl mono-, di- or tri-substituted by ($C_1$to C_4)-alkyl, (C_1 to C_4)-alkoxy, hydroxyl, halogen, nitro, amino, (C_1 to C_4)-alkylamino, di-(C_1 to C_4)-alkylamino and/or methylenedioxy; or 3-indolyl;

or a physiologically acceptable salt thereof.

4,558,066

TREATMENT AND PREVENTION OF OCULAR HYPERTENSION

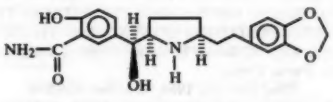
L. David Waterbury, San Mateo, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed May 17, 1984, Ser. No. 611,245

Int. Cl.[4] A61K *31/40*

U.S. Cl. 514—422 **11 Claims**

1. A method for treating elevated intraocular pressure in a mammal, which method comprises administering directly to the eye of a mammal in need of such treatment a therapeutically effective amount of a compound chosen from those represented by the formula



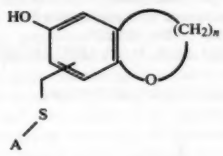
namely, ±2-[(3,4-methylenedioxy)phenethyl]-5-[(3-carboxamido-4-hydroxy)-α-hydroxybenzyl]pyrrolidine or a pharmaceutically acceptable acid addition salt thereof.

4,558,067
PHENYLTHIOMETHYL-6-HYDROXY-2,3-DIHYDROBENZO-PYRAN AND ANALOGS THEREOF USEFUL AS ANTI-INFLAMMATORY AGENTS

Kathryn L. Thompson, Westfield; Robert A. Zambias, Hoboken; Milton L. Hammond, Edison, and Michael N. Chang, Westfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Mar. 1, 1984, Ser. No. 585,070
Int. Cl.[4] A01N *43/16*; C07D *311/04*
U.S. Cl. 514—458 **12 Claims**

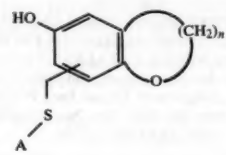
1. A compound of formula (I)



(I)

or a pharmaceutically acceptable salt thereof wherein
A is
(a) phenyl substituted with $(R^1)_q$ wherein when there are more than one R^1 ($q<1$) and R^1 can be the same or different from each other and is
(1) hydrogen;
(2) halo;
(3) loweralkoxy;
(4) lower alkylthio;
(5) lower alkyl sulfinyl;
(6) lower alkyl sulfonyl;
(7) unsubstituted or substituted phenyl loweralkoxy;
(8) loweralkyl;
(9) loweralkenyl;
(10) lower alkanoyl;
(11) halololoweralkyl;
(12) —COOH;
(13) aryl;
(14) aryloxy;
(15) cyano;
(16) hydroxyloweralkyl;
(17) halo loweralkanoyl; or
(18) loweralkanoyloxy;
q is 0 to 5; and
n is 3.

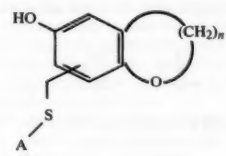
4. A pharmaceutical composition for treating topical inflammation comprising a pharmaceutical carrier and an anti-inflammatory effective amount of a compound of formula (I)



(I)

or a pharmaceutically acceptable salt thereof wherein
A is
(a) phenyl substituted with $(R^1)_q$ wherein when there are more than one R^1 ($q>1$) and R^1 can be the same or different from each other and is
(1) hydrogen;
(2) halo;
(3) loweralkoxy;
(4) lower alkylthio;
(5) lower alkyl sulfinyl;
(6) lower alkyl sulfonyl;
(7) unsubstituted or substituted phenyl loweralkoxy;
(8) loweralkyl;
(9) loweralkenyl;
(10) lower alkanoyl;
(11) halololoweralkyl;
(12) —COOH;
(13) aryl;
(14) aryloxy;
(15) cyano;
(16) hydroxyloweralkyl;
(17) halo loweralkanoyl; or
(18) loweralkanoyloxy;
q is 0 to 5; and
n is 3.

7. A method of treating or decreasing topical inflammation comprising the administration to a mammalian species in need of such treatment a anti-inflammatory effective amount of a compound of formula I



(I)

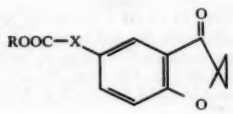
or a pharmaceutically acceptable salt thereof wherein
A is
(a) phenyl substituted with $(R^1)_q$ wherein when there are more than one R^1 ($q>1$) and R^1 can be the same or different from each other and is
(1) hydrogen;
(2) halo;
(3) loweralkoxy;
(4) lower alkylthio;
(5) lower alkyl sulfinyl;
(6) lower alkyl sulfonyl;
(7) unsubstituted or substituted phenyl loweralkoxy;
(8) loweralkyl;
(9) loweralkenyl;
(10) lower alkanoyl;
(11) halololoweralkyl;
(12) —COOH;
(13) aryl;
(14) aryloxy;
(15) cyano;
(16) hydroxyloweralkyl;
(17) halo loweralkanoyl; or
(18) loweralkanoyloxy;
q is 0 to 5; and
n is 3.

4,558,068
SPIROBENZOFURANONES AND THEIR USE IN TREATING PEPTIC ULCERS

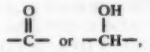
Hirosada Sugihara, Osaka; Masazumi Watanabe, Kawanishi; Mitsuru Kawada, Hyogo, and Isuke Imada, Osaka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Jul. 12, 1984, Ser. No. 630,291
Claims priority, application Japan, Aug. 1, 1983, 58-141704
Int. Cl.[4] A61K *31/34*; C07D *307/94*
U.S. Cl. 514—462 **7 Claims**

1. A spirobenzofuranone compound of the formula:

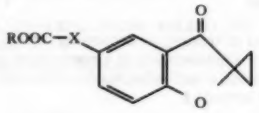


wherein R is a hydrogen atom or a lower alkyl and —X— is

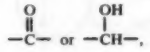


or a pharmaceutically acceptable salt thereof.

6. A method of treating peptic ulcer, which comprises administering a compound of the formula:



wherein R is a hydrogen atom or lower alkyl and —X— is



or a pharmaceutically acceptable salt thereof.

4,558,069

1,8-DIHYDROXY-9-ANTHRONES DERIVATIVES SUBSTITUTED IN THE 10-POSITION BY AN UNSATURATED RADICAL USED IN HUMAN MEDICINE

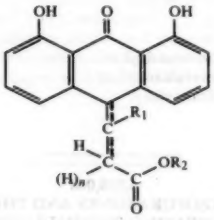
Braham Shroot, Antibes; Jean Maignan, Tremblay les Gonesse, and Gérard Lang, Epinay sur Seine, all of France, assignors to Groupement d'Interet Economique dit: Centre International de Recherches Dermatologiques C.I.R.D., Valbonne, France

Division of Ser. No. 346,893, Feb. 8, 1982, Pat. No. 4,464,301. This application May 31, 1984, Ser. No. 615,734

Int. Cl.[4] A61K *31/12, 31/34*

U.S. Cl. 514—473 **4 Claims**

1. A composition to be topically applied to the skin, which contains in a paraffin vehicle suitable for application to the skin, 0.01 to 5% by weight of a compound of the following formula:



wherein

R_1 represents hydrogen or $CO_2R'_2$,

R_2 and R'_2, identical or different, represent hydrogen, linear or branched chain alkyl radical of 1 to 6 carbon atoms, cycloalkyl of 4 to 6 carbon atoms or benzyl,

or R_1 and R_2 taken together form a —CO—, and

n is 0 or 1,

and mixtures thereof.

4,558,070

ACID SALTS OF VALPROIC ACID

John F. Bauer, Wilmette, Ill., and Douglas M. Shada, Kenosha, Wis., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Oct. 26, 1983, Ser. No. 545,710

Int. Cl.[4] A61K *31/19;* **C07C** *53/128*

U.S. Cl. 514—557 **5 Claims**

1. A compound of the formula M Valproate 0.3 Valproic Acid wherein M is an alkali metal ion selected from the group consisting of K, Cs and Rb.

4,558,071

PHENYL, TRIHALOMETHYL OR HETEROARYL SULFOXIDES HAVING A LATENT ALLYL GROUP BOUND TO SULFUR AS ENZYME INHIBITORS

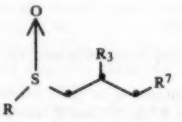
Raymond A. Firestone, Fanwood, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 147,659, May 7, 1980, Pat. No. 4,388,475, which is a continuation-in-part of Ser. No. 66,603, Aug. 15, 1979, abandoned. This application Feb. 25, 1983, Ser. No. 469,558

Int. Cl.[4] A61K *31/10;* **C07C** *147/08*

U.S. Cl. 514—570 **6 Claims**

1. The compound of structural formula:



or a pharmaceutically acceptable salt thereof, wherein:

R is phenyl or phenyl substituted with

(1) nitro

(2) cyano,

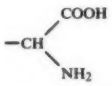
(3) C_{1-3} alkoxycarbonyl

(4) di(trifluoromethyl), or

(5) fluoro;

R^3 is halo; and

R^7 is $—NH_2$, or



5. A method of inhibiting enzymes in a patient in need of such treatment which comprises the administration of an enzyme inhibitory amount of the compound of claim 1 or a pharmaceutically acceptable salt thereof.

4,558,072

PROCESS FOR PREPARING ETHYLENE GLYCOL AND LOWER MONOHYDRIC ALCOHOLS FROM SYNGAS USING A NOVEL CATALYST SYSTEM

Robert A. Grigsby, Jr., Georgetown, and John F. Knifton, Austin, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Nov. 16, 1983, Ser. No. 552,631

Int. Cl.[4] C07C *27/06*

U.S. Cl. 518—701 **3 Claims**

1. A process for preparing ethylene glycol in improved yield comprising:

contacting a mixture of carbon monoxide and hydrogen in a mole ratio of 1:5 to 5:1 with a catalyst system comprising triruthenium-dodecacarbonyl combined with a rhodium-carbonyl wherein a higher ruthenium-to-rhodium mole ratio is used and a cycloalkadienyl manganese tricarbonyl, said compounds being dispersed in tetrabutylphosphonium bromide and dissolved in the solvent N-cyclohexyl-2-pyrrolidone, heating said mixture to a temperature between 150° C. and 350° C. and a pressure between 70 atm and 700 atm for a sufficient time to produce the desired ethylene glycol.

4,558,073

COMPOSITION FOR THE PRODUCTION OF POLYURETHANE FOAM MATERIALS HAVING IMPROVED FORM STABILITY

Hermann Kluth, and Jürgen Wegner, both of Düsseldorf, Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Düsseldorf, Fed. Rep. of Germany

Continuation of Ser. No. 385,101, May 4, 1982, abandoned. This application Jul. 25, 1984, Ser. No. 633,683

Claims priority, application Fed. Rep. of Germany, Jun. 9, 1981, 3122790

Int. Cl.[4] C08G *18/14;* C08J *9/00;* C09K *3/30*

U.S. Cl. 521—110 14 Claims

1. Polyurethane foam forming compositions suitable as one component systems contained in a pressure vessel, forming foams having improved stability with respect to post foam formation expansion, said compositions being mixtures of

(a) prepolymers containing free isocyanate groups in the range of about 5 to 25% by weight, based on the prepolymer, which are produced by reacting polyols selected from the group consisting of polyesters, polyethers and mixtures thereof with polyisocyanates;

(b) the usual adjuvants for polyurethane foams;

(c) expanding agents; and

(d) 0.02 to 0.05 percent by weight, based on the weight of the polyols plus adjuvants of a surface active polysiloxane compound which has antifoam activity selected from the group consisting of dimethylsiloxane and prefluorinated alkyl siloxane.

4,558,074

MOULD MATERIAL BINDING AGENT SYSTEM WHICH COLD-HARDENS WITH FORMATION OF POLYURETHANE

Marek Torbus, Dusseldorf, Fed. Rep. of Germany, assignor to Huttenes-Albertus Chemische Werke GmbH, Dusseldorf, Fed. Rep. of Germany

Filed Feb. 7, 1985, Ser. No. 699,062

Int. Cl.[4] C08L *75/04*

U.S. Cl. 523—142 6 Claims

1. Mould material binding agent system for the manufacture of foundry mould parts, the components of which are a solution of a phenol-containing polyol having at least two OH-groups in the molecule and a polyisocyanate, optionally in the form of a solution, having at least two NCO-groups in the molecule, which react with each other to a cold-hardening binding agent, characterized in that a chlorosilane is added to the polyisocyanate component.

4,558,075

HIGH-SOLIDS COATING COMPOSITION FOR IMPROVED RHEOLOGY CONTROL CONTAINING ORGANO-MODIFIED CLAY

Naomi R. Suss, Pittsburgh, and Samuel Porter, Jr., Natrona Heights, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 30, 1984, Ser. No. 595,131

Int. Cl.[4] C08K *3/34*

U.S. Cl. 523—216 8 Claims

1. An essentially solvent-based, organic, coating composition which is conventionally sprayable at a solids content of at least 40 percent by weight of the composition at which solids content said composition has a No. 4 Ford Cup viscosity of less than 25 seconds at ambient temperature comprising:

(A) a film-forming binder system containing a crosslinkable resin having a weight average molecular weight of from 300 to 15,000 and optionally a crosslinking agent for the crosslinkable resin;

(B) an organo-modified clay produced from an organic cation, an organic anion and smectite-type clay, which organo-modified clay is stably dispersed in the coating composition in an amount of from 0.5 to 20 percent by weight based on the sum by weight of the crosslinkable resin, the organo-modified clay, and when present the crosslinking agent; and

(C) a solvent system for the crosslinkable resin and the optional crosslinking agent.

4,558,076

COATING COMPOSITIONS

Alan J. Wright, Sidcup; Kevin J. O'Hara, Maidstone, and Stephen K. Turner, Orpington, all of England, assignors to Coates Brothers PLC, Kent, England

Filed Aug. 23, 1984, Ser. No. 643,409

Claims priority, application United Kingdom, Jul. 3, 1984, 8416927

Int. Cl.[4] C09D *3/58, 3/80*

U.S. Cl. 523—442 9 Claims

1. A coating composition comprising the following components dissolved in an organic solvent therefor:

(I) an addition copolymer derived from ethylenically unsaturated monomers and containing (a) from 0.8 to 8.0% by weight of free carboxyl groups based on the total weight of said addition copolymer, and (b) tertiary amino groups in an amount from 0.0 to 2% by weight of nitrogen based on said addition copolymer;

(II) at least one polyepoxide compound present in amount to provide from 0.2 to 2 epoxy groups for each carboxyl group in the addition copolymer;

(III) a metal compound selected from the group consisting of aluminum alkoxide, titanium alkoxide, zirconium alkoxide and complxes thereof together with a chelating agent therefor, present in an amount from 0.05 to 2.0% by weight, based on weight of said addition copolymer; and

(IV) a tertiary amino compound having tertiary amino groups and present in an amount of from 2 to 0.0% by weight of nitrogen based on said addition copolymer, a total amount of tertiary amino groups present in said composition providing from 0.1 to 2% by weight of nitrogen based on the weight of the addition copolymer.

4,558,077

EPOXY BONDED RARE EARTH-IRON MAGNETS

Richard K. Gray, Warren, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 8, 1984, Ser. No. 587,508

Int. Cl.[4] C08K *3/22*

U.S. Cl. 523—458 14 Claims

1. A compact for making a bonded rare earth-transition metal permanent magnet, said compact comprising particles of magnetizable rare earth-transition metal alloy blended with a dry epoxy powder comprised of a polyglycidyl ether of a polyphenol alkane having a glass transition temperature greater than about 150° and a latent imidazole catalyst for said epoxy which is substituted in the two position with an alkyl group, which dry epoxy powder melts at an elevated temperature to flow around the alloy particles and thereby protect them from oxidation and at which temperature the imidazole catalyst is first activated to cure the epoxy resin and bind the alloy particles together into a durable magnet body which is resistant to flux loss at temperatures below the glass transition temperature of the cured epoxy.

4,558,078

CURABLE EPOXY RESIN COMPOSITIONS

Daniel R. Draney, and Dalip K. Kohli, both of Norwalk, Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Aug. 1, 1983, Ser. No. 518,879

Int. Cl.[4] C08L *63/00;* C08K *3/04*

U.S. Cl. 523—468 12 Claims

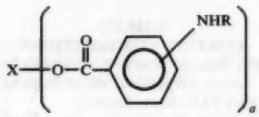
1. A fiber resin matrix composition comprised of:

(a) non-siliceous reinforcing filaments,

(b) a heat-curable epoxy resin composition comprising:

(i) an epoxy prepolymer or combination of prepolymers having more than one epoxide group per molecule,

(ii) an amount effective to promote cure of an amine functional curing agent selected from those of the formula:



wherein a is 2 or 3, R is hydrogen, alkyl or aryl, and X is divalent or trivalent organic hydrocarbon, hetero-interrupted hydrocarbon, or substituted hydrocarbon radical or

and

(c) a second homogeneous or heterogeneous polyether alcohol or polyetherimide resin component blended and alloyed with composition (b) in an amount sufficient to enhance toughness and resistance to failure under hot/wet stress conditions in composites produced from said composition.

4,558,079

TAPE JOINT CEMENT COMPOSITION

Armand J. Desmarais, New Castle County, Del., assignor to Hercules Incorporated, Wilmington, Del.

Continuation-in-part of Ser. No. 573,458, Jan. 24, 1984, abandoned, and Ser. No. 466,196, Feb. 14, 1983, abandoned. This application Dec. 24, 1984, Ser. No. 686,060

Int. Cl.[4] C08L *3/02*

U.S. Cl. 524—43 **15 Claims**

1. In joint cement composition having limestone; mica; a clay selected from the group consisting of attapulgite, bentonite, montmorillonite and mixtures thereof; a thickener, and a resinous binder as its principal ingredients, the improvement which comprises using from about 0.2% to about 2.0%, by weight based on the dry ingredients, of at least one hydroxypropylhydroxyethylcellulose having a hydroxyethyl substitution from about 0.5 to about 4.0 M.S. and a hydroxypropyl substitution greater than 0.36 to about 1.5 M.S. as a water retention aid and thickener.

4,558,080

STABLE TANNIN BASED POLYMER COMPOUND

Jane E. Quamme, Chicago, and Anne H. Kemp, Palatine, both of Ill., assignors to Dearborn Chemical Company, Lake Zurich, Ill.

Filed Jan. 24, 1984, Ser. No. 573,353

Int. Cl.[4] C08L *97/00, 99/00;* **C08K** *5/13*

U.S. Cl. 524—72 **24 Claims**

1. A method of forming an aqueous solution of a tannin based polymer compound suitable for use as a flocculant comprising the steps of

(a) forming an aqueous reaction mixture of a tannin, an amino compound, and an aldehyde under slightly acidic conditions where the pH is less than 7 and where the molar ratio of the primary amine from the amino compound to the tannin repeating unit is from about 1.5:1 to 3.0:1;

(b) heating the reaction mixture at a temperature of from about 150°–200° F. until the reaction product forms which has an intermediate viscosity within the range of the system key intermediate viscosity range, said system key intermediate viscosity range being determined for each reactant system as the narrow intermediate viscosity range which permits the resulting product to have a long shelf-life, said system key intermediate viscosity range being within the range of from about 2–100 cps when measured at 180° F. on a Brookfield LVT viscometer, and

(c) terminating the reaction when the intermediate viscosity has reached the condition specified in step (b) and adjusting the solids content of the liquid to about 20 to 60% by weight and adjusting the pH to a value of less than 3.0.

4,558,081

CARBONATE POLYMER CONTAINING AN IGNITION DEPRESSANT COMPOSITION

Lowell S. Thomas, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 471,597, Mar. 3, 1983, Pat. No. 4,486,560. This application Oct. 26, 1984, Ser. No. 665,222

Int. Cl.[4] C08K *5/43*

U.S. Cl. 524—100 **12 Claims**

1. A carbonate polymer composition comprising a carbonate polymer having dispersed therein, in an amount sufficient to provide improved flame retardancy to said carbonate polymer, a fire retardant additive comprising (1) a metal salt of an aromatic sulfonamide and/or a metal salt of an inorganic acid wherein said metal salt of an aromatic sulfonamide contains at least one radical represented by the formula:

wherein Ar is an aromatic group, M is a metal cation and n is a number corresponding to the valence of M, (2) a halogenated organic compound and (3) a non-polymeric melamine compound.

4,558,082

ACRYLATED POLYMERS

Richard P. Eckberg, Saratoga Springs, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed May 10, 1984, Ser. No. 608,748

Int. Cl.[4] C08K *5/34*

U.S. Cl. 524—104 **23 Claims**

1. A process for making acrylic functional polysiloxane compositions, comprising reacting

(a) an epoxy functional polysiloxane with

(b) acrylic acid, substituted acrylic acid, a hydroalkylacrylate, or mixture thereof in the presence of

(c) an amount of catalyst effective for catalyzing the reaction of (a) and (b), said catalyst being selected from the group consisting of tetraalkylurea, tetraalkylguanidine and mixtures thereof.

4,558,083

STABILIZER COMPOSITIONS AND POLYMERS CONTAINING SAME

Thomas G. Kugele, Cincinnati, Ohio, assignor to Morton Thiokol, Inc., Chicago, Ill.

Continuation of Ser. No. 345,822, Feb. 4, 1982, abandoned, which is a continuation-in-part of Ser. No. 238,517, Feb. 26, 1981, Pat. No. 4,315,850. This application Jan. 10, 1984, Ser. No. 569,542

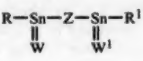
The portion of the term of this patent subsequent to Feb. 16, 1999, has been disclaimed.

Int. Cl.[4] C08K *5/58*

U.S. Cl. 524—181 **4 Claims**

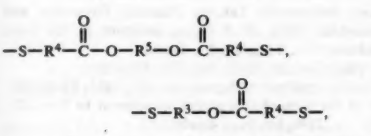
1. A stabilizer composition comprising:

A. an organic tin compound or mixture of organic tin compounds selected from compounds having the formulas:

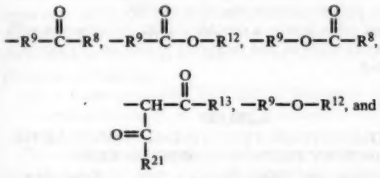


(IIa)

wherein
W and W^1 are the same or different and are oxygen or sulfur;
Z is

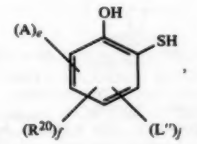


R and R^1 are the same or different and are selected from alkyl, aryl, alkenyl, aralkyl, alkaryl, cycloalkyl, cycloalkenyl,

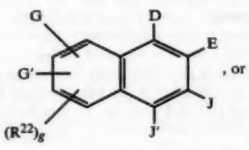


R^3 is alkylene of at least 2 carbon atoms, arylene, alkenylene of at least 2 carbon atoms, cycloalkylene, or cycloalkylene
R^4 is alkylene, arylene, alkenylene of at least 2 carbon atoms, cycloalkylene, or cycloalkenylene;
R^5 is R^3;
R^6 is nothing or R^4;
R^8 is alkyl, alkenyl, aryl, aralkyl, alkaryl, cycloalkyl, or cycloalkenyl;
R^9 is C_1 to C_4 alkylene;
R^{12} is —H or a monovalent C_1 to C_{20} hydrocarbon radical;
R^{13} and R^{21} are the same or different and are each C_1 to C_{20} alkyl or C_1 to C_{20} alkoxy; and

B. an organic compound or mixture of organic compounds selected from compounds having the following formulas:



(III)



(IV)

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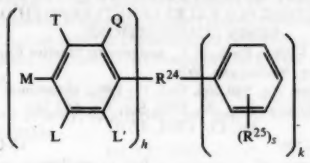


(V)

wherein
A is nothing, —OH or —SH,
L'' is nothing, —OH or —SH
D is —H, —SH, —OH or R^{26}
E is —H, —OH, —SH or R^{26}
J is —H, —SH, —OH or R^{26}
J' is —H, —OH, —SH or R^{26}
G is nothing, —OH or —SH
G' is nothing, —SH or —OH
L is —H, —SH, —OH or R^{23}
L' is —H, —OH, —SH or R^{23}
M is —H, —SH, —OH or R^{23}
T is —H, —SH, —OH or R^{23}
Q is —H, —SH, —OH or R^{23}
R^{20} is nothing, alkyl, aryl, alkenyl, alkaryl, cycloalkyl, alkoxy or halogen,
R^{26} is alkyl, alkenyl or halogen
R^{22} is alkyl, alkenyl or halogen
RHU 23 is alkyl, alkenyl or halogen
R^{24} is alkylene or alkenylene
R^{25} is alkyl, alkenyl, halogen, —SH or —OH
e is 0 to 2
j is 0 to 2
f is 0 to 3
s is 0 to 3
g is 0 to 3
h is 1 to 4
k is 0 to 3
h+k is 2 to 4
e+j+f is 0 to 4
with the proviso that (1) in formula (IV) two of groups D, E, J and J' must be an OH group and an SH group bonded direct to adjacent ring carbon atoms, and (2) in formula (V) two of groups L, L', M, T and Q must be an OH group and an SH group bonded directly to adjacent ring carbon atoms.

4,558,084

PLASTISOL COMPRISING A COPOLYMER OF METHYL METHACRYLATE AND ITACONIC OR ITS ANHYDRIDE

Peter Quis, Darmstadt-Neu-Kranichstein; Werner Siol, Pfungstadt; Joachim Buechse, Trebur, and Hubert Rauch, Weiterstadt, all of Fed. Rep. of Germany, assignors to Röhm GmbH, Darmstadt, Fed. Rep. of Germany

Filed Sep. 20, 1982, Ser. No. 420,040

Claims priority, application Fed. Rep. of Germany, Oct. 1, 1981, 3139090

Int. Cl.[4] **C08L** *33/12, 35/00;* **C08J** *3/06;* **C09D** *3/80*

U.S. Cl. 524—294 **5 Claims**

1. A plastisol comprising a copolymer consisting of methyl methacrylate and from 0.1 to 10 percent by weight of said copolymer of itaconic acid or of itaconic acid anhydride, said copolymer having a glass transition temperature above 50° C., a degree of polymerization greater than 400, and an average particle size between 0.1 and 500 microns, said plastisol further comprising from 100 parts to 1000 parts by weight, per 100 parts by weight of said copolymer, of an organic plasticizer compatible with said copolymer.

3. A plastisol as in claim 1 wherein said plasticizer is benzyloctyl phthalate.

4,558,085

PROCESS FOR THE PREPARATION OF FAST CRYSTALLIZING POLYALKYLENETEREPHTHALATE RESIN COMPOSITIONS

Chung J. Lee, Clifton Park, N.Y., assignor to Plastics Engineering Company, Sheboygan, Wis.

Division of Ser. No. 540,366, Oct. 11, 1983, abandoned. This application Aug. 20, 1984, Ser. No. 642,343

Int. Cl.[4] C08L 67/02

U.S. Cl. 524—299 13 Claims

1. The process of preparing a fast crystallizing molding composition comprising the steps of:

(a) preparing a preformed complex of a sodium carboxylate selected from the group consisting of sodium acetate and sodium propionate and a polymeric compound having at least two recurring units of the formula —CH_2CH_2O— by dissolving the sodium carboxylate and the said polymeric compound in a solvent and thereafter evaporating the solvent from the resultant complex or by co-mixing the sodium carboxylate in the said polymeric compound at a temperature of 50°–200° C. for 5–60 minutes until a homogeneous liquid state is achieved,

(b) adding said preformed complex to a polyalkyleneterephthalate in which the alkylene group has 2–4 carbon atoms, the amount of added complex being enough to give a proportion of 0.05–4 percent by weight of sodium carboxylate, based on the weight of said polyalkyleneterephthalate, and

(c) effecting intimate mixture of said complex and said polyalkyleneterephthalate.

12. The process of claim 1, wherein there is also present in the polyalkyleneterephthalate 0.5 to 15 percent by weight of a plasticizer selected from the group consisting of a block copolyester ether, dibenzoate of neopentyl glycol, dibenzoate of dipropylene glycol, and a monoester of a fatty acid containing 1 to 32 carbon atoms.

4,558,086

METHOD FOR SUPPRESSING ZINC STEARATE AGING BLOOM

Floyd L. Ramp, Richfield, and Lothar F. Stiberth, Copley, both of Ohio, assignors to The B. F. Goodrich Company, New York, N.Y.

Filed Oct. 4, 1984, Ser. No. 657,447

Int. Cl.[4] C08K 5/09

U.S. Cl. 524—399 8 Claims

1. In a method for making a rubber compound wherein a rubber intermediate is formed having as principal constituents rubber, and optionally fillers, and wherein the formed intermediate includes a zinc containing substance convertible from a form not subject to bloom upon aging to a form subject to aging bloom and at least one proton donating substance capable of substantially promoting conversion from one form to the other at a temperature exceeding a predetermined temperature, the improvement comprising the steps of: (a) heating the intermediate during formation to a temperature sufficient and for a sufficient duration to convert substantially all the zinc substance to the form not subject to aging bloom; (b) eliminating the bloom promoting capability of proton donating substance; and (c) then reducing the temperature of the intermediate to below the predetermined temperature.

4,558,087

VINYL CHLORIDE RESIN COMPOSITION FOR PRODUCTION OF HARD ARTICLES

Masahiro Yamakawa; Mamoru Nakamura, both of Takaoka, and Toyoichi Arai, Himi, all of Japan, assignors to Nippon Zeon Co. Ltd., Tokyo, Japan

Filed Jul. 11, 1984, Ser. No. 629,604

Claims priority, application Japan, Jul. 13, 1983, 58-127104

Int. Cl.[4] C08K 3/04; C08L 27/06

U.S. Cl. 524—495 6 Claims

1. A vinyl chloride resin composition for production of hard articles, said composition comprising 100 parts by weight of a graft polymer and not more than 40 parts by weight of electrically conductive carbon black, said graft polymer being obtained by polymerizing 99 to 60% by weight of vinyl chloride or a monomeric mixture composed of at least 80% by weight of vinyl chloride and not more than 20% by weight of a monomer copolymerizable with it in the presence of 1 to 40% by weight of a copolymer composed of 5 to 75% by weight of methyl methacrylate and 95 to 25% by weight of ethylene.

4,558,088

COMPOSITION FOR CARCASS OF TIRE

Masanori Kan, Amagasaki; Takuya Okazaki, Toyonaka, and Tatsuo Sakashita, Suita, all of Japan, assignors to The Toyo Rubber Industry Co., Ltd., Osaka, Japan

Filed Jun. 18, 1982, Ser. No. 389,688

Claims priority, application Japan, Jun. 24, 1981, 56-98628

The portion of the term of this patent subsequent to Nov. 22, 2000, has been disclaimed.

Int. Cl.[4] C08K 5/01; C08L 9/06, 7/00, 53/02

U.S. Cl. 524—505 1 Claim

1. A carcass rubber composition for tires comprising:

a polymer blend of diene synthetic elastomer and natural rubber, said diene synthetic elastomer containing a solution polymerization star shaped SBR, said solution polymerization star shaped SBR comprising 20–50 percent of said rubber composition and the content of 1,2 structure in the butadiene unit is less than 50 percent and the styrene content is 10–20 percent in the micro structure of said solution polymerization star shaped SBR; and

naphthenic oil whereby a carcass rubber composition with high penetration of and tackiness to carcass ply cords is provided.

4,558,089

RESIN COMPOSITION CONTAINING GRANULAR OR POWDERY PHENOL-ALDEHYDE RESIN

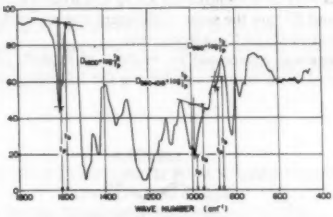
Hiroaki Koyama, and Shigeo Shimizu, both of Kobe, Japan, assignors to Kanebo Ltd., Tokyo, Japan

Division of Ser. No. 452,737, Dec. 23, 1982, Pat. No. 4,476,277. This application Jun. 12, 1984, Ser. No. 619,833

Claims priority, application Japan, Dec. 26, 1981, 56-209558; Dec. 28, 1981, 56-209850; Feb. 18, 1982, 57-023530; Mar. 4, 1982, 57-033099; Mar. 4, 1982, 57-033100; Mar. 5, 1982, 57-034036

Int. Cl.[4] C08L 61/14

U.S. Cl. 524—509 24 Claims



1. A resin composition comprising

(I) a granular or powdery resin which is a condensation product of a phenol and an aldehyde and wherein at least 30% of the granular or powdery resin consists of spherical primary particles and their secondary agglomerated particles each having a particle diameter of 0.1 to 150 microns, (B) said granular or powdery resin has such a size that at least 50% by weight thereof can pass through a 100 Tyler mesh sieve, and (C) said granular or powdery resin has a free phenol content, determined by liquid chromatography, of not more than 500 ppm, and

(II) at least one rubber elastic material selected from the group consisting of natural rubber, polybutadiene, polyisoprene, copoly(butadiene-styrene), copoly(butadieneacrylonitrile), copoly(ethylene-propylene), polyisobutylene, copoly(isobutylene-isoprene), polychloroprene, polyacrylate rubber, polysulfide, silicone rubbers, chlorinated polyethylene, fluorine rubber chlorosulfonated polyethylene, and polyurethan.

4,558,090

WATER-DILUTABLE COATING AGENT FOR PREPARING THE BASE LAYER OF A MULTILAYER COATING

Hermann-Josef Drexler, Guntersleben; Franz Ebner, Kist; Hans-Dieter Hille, Berg. Gladbach, and Ulrich Poth, Münster, all of Fed. Rep. of Germany, assignors to BASF Farben & Fasern AG, Hamburg, Fed. Rep. of Germany

Division of Ser. No. 467,865, Feb. 18, 1983, Pat. No. 4,489,135. This application Oct. 2, 1984, Ser. No. 657,063

Claims priority, application Fed. Rep. of Germany, Mar. 19, 1982, 3210051

Int. Cl.[4] **C08J** *75/00*

U.S. Cl. 524—591 **7 Claims**

1. A water-dilutable coating agent for preparing the base layer of a multilayer coating and which contains pigments and as a binder an aqueous polyurethane dispersion which has a polyurethane resin acid number of 5 to 70 and which has been prepared by reacting:

(A) a linear polyether diol and/or polyester diol having terminal hydroxyl groups and a molecular weight of 400 to 3,000 with

(B) a diisocyanate to form a first intermediate product in such a molar ratio that said first intermediate product is formed which has terminal isocyanate groups;

(C) and reacting said first intermediate product with a compound which has two groups which are reactive toward isocyanate groups and at least one group which is capable of forming an anion, said compound neutralized with a tertiary amine before the reaction and forming a second intermediate product, converting said second intermediate product, obtained from (A), (B) and (C), into a predominantly aqueous phase; and

(D) reacting isocyanate groups which are still present with a diamine and/or polyamine having primary and/or secondary amino groups.

4,558,091

METHOD FOR PREPARING ALUMINUM AND POLYHYDRIC ALCOHOL MODIFIED LIQUID ABSORBING COMPOSITION

Edward D. Hubbard, West Liberty, Iowa, assignor to Grain Processing Corporation, Muscatine, Iowa

Continuation of Ser. No. 494,118, May 13, 1983, abandoned. This application Aug. 7, 1984, Ser. No. 638,382

Int. Cl.[4] **C08L** *3/02, 3/04*

U.S. Cl. 524—734 **7 Claims**

1. A method for modifying a hydrolyzed starchpolyacrylonitrile or methacrylonitrile graft copolymer which comprises treating said copolymer in dry state with an aqueous source of aluminum ions.

4,558,092

AQUEOUS DISPERSION OF SULFO-CONTAINING POLYMERS FOR CEMENT ADDITIVE APPLICATIONS

Rolf Reinecke, Wiesbaden; Helmut Rinno, Hofheim am Taunus, and Gerhart Schultz, Darmstadt, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed May 27, 1983, Ser. No. 498,942

Claims priority, application Fed. Rep. of Germany, May 29, 1982, 3220384

Int. Cl.[4] **C08L** *41/00*

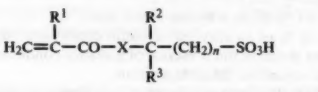
U.S. Cl. 524—817 **17 Claims**

1. An aqueous dispersion of a copolymer of olefinically unsaturated compounds, wherein the copolymer is composed substantially of

(a) from 90 to 97.7 weight % of moieties of at least one olefinically unsaturated monomer which is free from amide and sulfo groups,

(b) from 0.5 to 5 weight % of moieties of at least one olefinically unsaturated monomer having one amide group, and

(c) from 1.8 to 5 weight % of moieties of at least one olefinically unsaturated monomer of the formula



in which R^1, R^2 and R^3 are identical or different, each representing a hydrogen atom or a methyl radical, X is an oxygen atom or an imino group, and n is zero or an integer of from 1 to 10,

and has a second order transition temperature not exceeding 20° C.

4,558,093

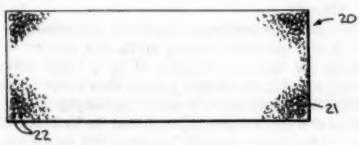
LASER BARRIER

John R. Hatzenbuhler, 1917 E. Kenmore Pl., Shorewood, Wis. 53211, and Thomas A. Lindl, 3325 W. Juneau Ave., Milwaukee, Wis. 53208

Filed Apr. 30, 1984, Ser. No. 605,206

Int. Cl.[4] **C08J** *9/32;* **C08K** *3/20, 7/28;* **C08L** *83/04*

U.S. Cl. 524—837 **4 Claims**



1. A laser shield, consisting essentially of

a dispersion of water in liquid droplet form encapsulated in a matrix of silicone rubber to provide a flexible material to terminate laser radiation without producing a substantial carbon plume.

4. A surgical drape, comprising a flexible and light weight sheet material to be applied adjacent to an area subject to laser radiation and formed of a dispersion of densely packed bubbles encapsulated in a matrix of silicone rubber to terminate laser radiation, said bubbles include water in liquid droplet form.

4,558,094

PROCESS FOR PRODUCING A CROSSLINKED PRODUCT OF A SILANE GRAFTED PROPYLENE RESIN

Jichio Deguchi, and Takayuki Inoue, both of Yokkaichi, Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

Filed Dec. 15, 1983, Ser. No. 561,727
Claims priority, application Japan, Dec. 22, 1982, 57-225295
Int. Cl.[4] C08L *51/06*
U.S. Cl. 525—71 **26 Claims**

1. A process for producing a crosslinked product of a propylene resin which comprises: exposing a composition comprising

(A) 60 to 90 wt % of a modified propylene resin which is prepared by grafting onto a propylene resin an ethylenically saturated silane compound represented by the formula

$$RSiR'_nY_{3-n}$$

wherein R is an ethylenically unsaturated hydrocarbon group or a hydrocarbon oxy group, R' is an aliphatic saturated hydrocarbon group, and Y is a hydrolyzable organic group and n is 0, 1 or 2;

(B) 20 to 5 wt % of an ethylene resin; and

(C) 20 to 5 wt % of an ethylene-α-olefin copolymer rubber, to water or steam in the presence of a silanol condensation catalyst to crosslink the composition.

18. A crosslinked polypropylene resin composition comprising:

(A) 60 to 90 wt % of modified polypropylene resin obtained by grafting onto a polypropylene resin an ethylenically unsaturated silane compound represented by the formula

$$RSiR'_nY_{3-n}$$

wherein R is an ethylenically unsaturated hydrocarbon group or a hydrocarbon oxy group, R' is an aliphatic saturated hydrocarbon group, and Y is a hydrolyzable organic group and is 0, 1 or 2;

(B) 20 to 5 wt. % of an ethylene resin; and

(C) 20 to 5 wt. % of an ethylene-α-olefin copolymer rubber, wherein said composition has been exposed to water or steam in the presence of a silanol condensation catalyst to effect the crosslinking thereof.

4,558,095

COATING COMPOSITION CONTAINING POLYMERIC SURFACTANT

Bruce P. Barth, White Plains, N.Y., and Charles B. Mallon, Belle Mead, N.J., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Apr. 1, 1985, Ser. No. 718,369
Int. Cl.[4] C08L *27/22, 27/06, 29/04, 35/06*
U.S. Cl. 525—57 **11 Claims**

1. A non-aqueous coating composition comprising:

(a) A graft copolymer, having surfactant properties, comprising the reaction product of (i) a vinyl copolymer having a molecular weight greater than about 3,500, comprising vinyl chloride, a vinyl carboxylic ester, and a source of hydroxyl groups, such that the hydroxyl content prior to reaction is about 0.5 to about 8% by weight of the vinyl copolymer and of which about 1 to about 75% of said hydroxyl groups have been reacted with (ii) an anhydride copolymer comprising the reaction product of an aromatic monomer and a dicarboxylic acid anhydride, such that the graft copolymer has a molecular weight of up to about 30,000, and a vinyl copolymer/anhydride copolymer weight ratio of about 20 to about 2, of which a sufficient number of carboxyl groups have been hydrolyzed to produce surfactant properties;

(b) a dispersible powder,

(c) optionally, other hard resins,

(d) optionally, a rubbery polymer,

(e) optionally, a supplemental surfactant,

all mixed in an organic solvent.

4,558,096

HIGH PERFORMANCE RUBBER-POLYESTER BLENDS

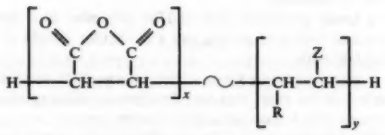
Wyndham H. Boon, North Canton, and James N. Henderson, Hudson, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 475,288, Mar. 14, 1983, abandoned. This application Jun. 4, 1984, Ser. No. 616,988
Int. Cl.[4] C08L *67/02, 23/16*
U.S. Cl. 525—166 **20 Claims**

1. A composition having a balance of properties suitable for molding purposes and having high impact resistance, said composition comprising an admixture of

(a) from about 10 to about 90 percent by weight polyethylene terephthalate;

(b) from about 10 to about 90 weight percent of at least one rubber selected from the group consisting of EPDM rubbers and EPR rubbers; and p1 (c) from about 0.001 to about 2.0 weight percent of at least one member selected from the group consisting of alkyl succinic anhydrides wherein said alkyl group contains from 8 to 30 carbon atoms, alkenyl succinic anhydrides wherein said alkenyl group contains from 8 to 30 carbon atoms, and dimers, oligomers, and polymers of the structural formula:



wherein x and y are integers, wherein R and Z can be the same or different, wherein R and Z are selected from the group consisting of alkyl moieties containing from 1 to 30 carbon atoms, alkenyl moieties containing from 2 to 30 carbon atoms, and hydrogen, wherein the total number of carbon atoms in R and Z is between 8 and 30, and wherein the $\sim$ indicates that the repeat units can be distributed in any order.

4,558,097

NYLON COMFORT FIBER CONTAINING POLY(N,N-DIMETHYLACRYLAMIDE)

Robert A. Lofquist, Richmond; Ian C. Twilley, Chester, and Peter R. Saunders, Richmond, all of Va., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Division of Ser. No. 547,157, Oct. 31, 1983, Pat. No. 4,458,053. This application May 11, 1984, Ser. No. 609,375
Int. Cl.[4] C08F *8/30*
U.S. Cl. 525—183 **1 Claim**

1. A nylon fiber, useful for improved comfort for wearers of apparel fabric made therefrom comprising a graft copolymer of nylon on poly(N,N-dimethylacrylamide) of (a) from about 5 to 15% by weight of poly(N,N-dimethylacrylamide) having a molecular weight which in a 25% aqueous solution gives a viscosity of from about 20 to 1000 centipoise at 25° C. and (b) correspondingly from about 85 to 95% by weight nylon.

4,558,098

METHACRYLIC RESIN COMPOSITION

Kazumasa Kamata, Tokyo; Yoshio Nakai, Iwakuni, and Yasunori Shimomura, Ohtake, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Dec. 19, 1983, Ser. No. 563,021

Claims priority, application Japan, Dec. 28, 1982, 57-233082; Dec. 28, 1982, 57-233083; Dec. 29, 1982, 57-229864

Int. Cl.[4] C08L *25/14, 33/12, 35/06*

U.S. Cl. 525—207 18 Claims

1. A heat-resistant transparent methacrylic resin composition which comprises 5 to 95% by weight of a copolymer [I] obtained by (A) copolymerizing 40 to 98% by weight of methyl methacrylate, 1 to 25% by weight of an aromatic vinyl compound and 1 to 25% by weight of maleic anhydride or (B) copolymerizing 40 to 97% by weight of methyl methacrylate, 1 to 20% by weight of an alpha-methyl styrene, 1 to 20% by weight of styrene or vinyl toluene and 1 to 20% by weight of maleic anhydride and 95 to 5% by weight of polymer [II] obtained by copolymerizing 80 to 100% by weight of methyl methacrylate and 0 to 20% by weight of at least one other copolymerizable ethylenic monomer.

4,558,099

THERMOPLASTIC RESIN HAVING EXCELLENT IMPACT RESISTANCE AND HEAT RESISTANCE

Kazuo Kishida; Naoki Yamamoto, both of Hiroshima, and Yasumasa Sato, Tokorozawa, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Nov. 27, 1984, Ser. No. 675,232

Claims priority, application Japan, Nov. 30, 1983, 58-225596; Dec. 1, 1983, 58-227536

Int. Cl.[4] C08F *265/02*

U.S. Cl. 525—301 10 Claims

1. A thermoplastic resin having excellent impact resistance and heat resistance obtainable by polymerizing 93 to 30 parts by weight of a monomer mixture comprising 20 to 90% by weight of at least one α-alkylaromatic vinyl monomer, 10 to 40% by weight of at least one vinyl cyanide monomer and 0 to 60% by weight of at least one vinyl monomer copolymerizable therewith (100% by weight in total) in the presence of 7 to 70 parts by weight (in terms of solid) of a rubber latex of a large particle size having a particle diameter of at least 0.2 μm obtained by adding 0.1 to 5 parts by weight (in terms of solid) of an acid-group containing copolymer (B) latex obtained from 3 to 30% by weight of an acid-group containing monomer, 97 to 35% by weight of at least one alkyl acrylate having 1 to 12 carbon atoms in the alkyl group, and 0 to 48% by weight of at least one vinyl monomer copolymeriable therewith (100% by weight in total) to 100 parts by weight (in terms of solid) of a rubber (A) latex of a small particle size having a pH of 7 or above obtained from 100 to 50% by weight of 1,3-butadiene and 0 to 50% by weight of other copolymerizable monomers having $CH_2{=}C<$ group (100% by weight in total).

4,558,100

ABSORBENT COMPOSITIONS

Adrian P. Kightlinger, Muscatine, and E. Daniel Hubbard, West Liberty, both of Iowa, assignors to Grain Processing Corporation, Muscatine, Iowa

Filed Jul. 3, 1984, Ser. No. 627,444

Int. Cl.[4] C08F *8/44*

U.S. Cl. 525—329.1 25 Claims

1. A process for preparing a composition capable of absorbing substantial quantities of liquids which comprises polymerizing at an acidic pH acrylonitrile or methacrylonitrile in the presence of about 0.03 to 5.0% by weight thereof of a polyfunctional monomeric cross-linking agent containing at least two polymerizable ethylenic groups per molecule, saponifying the resulting polymer with an aqueous alcoholic solution of an alkali base and recovering a granular, substantially water-insoluble liquid absorbing composition.

4,558,101

PROCESS FOR THE PREPARATION OF POLYMERIC AMINE CONTAINING PRODUCTS

Felek Jachimowicz, Columbia, Md., and P. E. Anders Hansson, Helsingborg, Sweden, assignors to W. R. Grace & Co., New York, N.Y.

Division of Ser. No. 476,773, Mar. 18, 1983, Pat. No. 4,526,936. This application Jul. 23, 1984, Ser. No. 633,390

Int. Cl.[4] C08F *8/32*

U.S. Cl. 525—333.2 9 Claims

1. A polymeric product comprising a polymer having a hydrocarbon backbone chain which is substantially free of olefinic double bond groups and having pendant from said backbone chain a plurality of alkylene alkylamine groups; said polymer being substantially free of amino, enamine and aldehyde groups and formed by contacting under substantially anhydrous conditions a polymer containing olefinic double bond groups therein with an amine selected from primary or secondary amine, hydrogen and carbon monoxide in the molar ratio of amine to olefinic double bond of at least about 1:1, of hydrogen to olefinic double bond of at least about 2:1 and of carbon monoxide to olefinic double bond of at least about 1:1 in the presence of a catalytic amount of a Group VIII metal containing compound and an organic liquid in which the polymer and amine have solubility.

4,558,102

METHOD FOR CURING HALOGEN-CONTAINING RUBBER COMPOSITION

Shigeo Miyata, Takamatsu, Japan, assignor to Kyowa Chemical Industry Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 505,291, Jun. 17, 1983, abandoned. This application Aug. 1, 1984, Ser. No. 636,710

Claims priority, application Japan, Jun. 18, 1982, 57-103907

Int. Cl.[4] C08C *19/00*

U.S. Cl. 525—348 6 Claims

1. In a method for curing a curable rubber composition composed of a halogen-containing rubber and a member selected from the group consisting of a vulcanizing agent and a vulcanization accelerator other than thiazole-type vulcanization accelerators under heat in the presence of an acid acceptor, the improvement wherein said composition is cured under heat in the presence of, as said acid acceptor, a calcinated product of a hydrotalcite compound, obtained by calcination at a temperature of 200° C. to 900° C., of the following formula

$$M_x^{2+}Al_2(OH)_{2x+6-nz}(A^{n-})_z{\cdot}mH_2O \qquad (I)$$

wherein M^{2+} represents at least one metal element selected from the group consisting of Mg and Zn, A^{n-} represents an anion having a valence of n, m represents a positive number, and x and z represent psotive numbers satisfying the following expressions

$$12 > x \leqq 2,$$

$$z \leqq 2,$$

thereby giving a cured product having increased water resistance.

4,558,103

POLYPHOSPHAZENE POLYMERS CONTAINING DIALLYAMINO SUBSTITUENTS

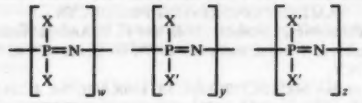
William L. Hergenrother, Akron, and Adel F. Halasa, Bath, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Jan. 22, 1985, Ser. No. 693,443

Int. Cl.[4] C08G *79/02, 79/04*

U.S. Cl. 525—538 7 Claims

1. A polyphosphazene copolymer comprised of units represented by the formulas:



wherein X is $-N(CH_2-CH=CH_2)_2$ and X' is selected from a group consisting of substituted or unsubstituted alkoxy, aryloxy, amino or mercapto substituent group or mixtures thereof; $20 \leqq (w+y+z) \leqq 50{,}000$ per copolymer and $(y+z)>0$.

4,558,104

CONTINUOUS PREPARATION OF ISOBUTYLENE POLYMERS

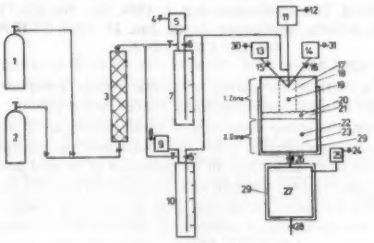
Klaus Bronstert, Carlsberg; Johann Nickl, Bad Durkheim; Hans-Joachim Krause, Ludwigshafen, and Werner Schmitt, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 28, 1983, Ser. No. 566,292

Claims priority, application Fed. Rep. of Germany, Jan. 5, 1983, 3300155

Int. Cl.[4] C08F *2/00*

U.S. Cl. 526—65 **3 Claims**



1. A process for the continuous preparation of an isobutylene polymer by homopolymerization of isobutylene or copolymerization of isobutylene with compounds which are copolymerizable with it, in an aliphatic C_3–C_6-hydrocarbon as the solvent, in the presence of, in each case, from 0.001 to 0.1 percent by weight, based on the weight of the monomers, of a cationic polymerization initiator and a coinitiator which are soluble in the solvent, at from −40° to 40° C. under from 0.01 to 10 bar in the absence of air and of moisture, the solvents and monomers vaporized during the polymerization being taken off continuously, liquefied, and fed again into the polymerization zone as a liquid recycle, wherein the liquid stream of the monomer solution, containing 40–95 percent by weight of the monomers, the liquid streams of the recycle and of the coinitiator solution and the separate stream of the initiator solution are combined in the mixing zone which is situated in a polymerization first zone and in which the polymerizing mixture flows freely in a downward direction onto the foam covered surface in which the polymerization continues; the resulting polymer solution is then collected in a second zone located vertically beneath the first zone, without any mixing of the polymer solution with the polymerizing mixture of the polymerization zone taking place; and finally the pure solution consisting of the isobutylene polymer and solvent is withdrawn continuously in a downward direction.

4,558,105

COPOLYMERIZATION OF ETHYLENE

Wayne L. Carrick, Long Grove; R. Sven Solvik, Barrington, both of Ill., and William Kirch, Clinton, Iowa, assignors to Chemplex Company, Rolling Meadows, Ill.

Filed Dec. 7, 1983, Ser. No. 558,928

Int. Cl.[4] C08F *10/02*

U.S. Cl. 526—68 **8 Claims**

1. A method of copolymerizing ethylene with at least one comonomer comprising a 1-olefin having three to eight carbon atoms in the main chain thereof, said method comprising the step of reacting a gaseous mixture of said ethylene and said comonomer in the presence of a coordination metal copolymerization catalyst in a reactor of a reaction system comprising said reactor and a recycle system operating at a pressure and temperature lower than those of said reactor, said reaction being carried out at a temperature of about 300° F. to about 600° F. and at a pressure of about 10,000 psi to about 20,000 psi, said gaseous mixture further including a low molecular weight inert gas ratio modifier selected from the group consisting of methane, ethane and nitrogen, and mixtures thereof, in a concentration sufficiently high to maintain the dew point of said gaseous mixture below the lowest temperature encountered by said mixture in said reaction system and to maintain the ratio of said comonomer to said ethylene sufficiently high to produce copolymers having densities of about 0.94 g/cc or below.

4,558,106

POLYMERIZATION PROCESS USING METAL FORMATE TO REDUCE THE COLOR OF THERMOPLASTIC COPOLYMERS

James H. Kawakami, Piscataway, and Louis M. Maresca, Belle Mead, both of N.J., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Mar. 29, 1983, Ser. No. 480,474

Int. Cl.[4] C08F *2/00*

U.S. Cl. 526—216 **32 Claims**

1. An improved process for producing a thermoplastic polymer selected from the group consisting of a polyarylate, a polyetherimide, an aromatic polycarbonate, a poly(ester carbonate), a styrene polymer, an alkyl acrylate polymer, a polyurethane, a vinyl chloride polymer, a poly(aryl ether), a copolyetherester block polymer, a polyhydroxyether or combinations thereof, wherein the improvement comprises adding an alkali or alkaline earth metal formate or mixtures thereof to monomer(s) before polymerization to reduce the color of the resultant polymer.

4,558,107

AROMATIC HIGH SOFTENING POINT PETROLEUM RESINS AND PROCESS FOR ITS PREPARATION

Morris L. Evans, and Augustus B. Small, both of Baton Rouge, La., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 387,342, Jun. 11, 1982, abandoned. This application Apr. 16, 1984, Ser. No. 601,024

Int. Cl.[4] C08F *240/00*

U.S. Cl. 526—237 **7 Claims**

1. A process for preparing a high softening point resin which comprises polymerizing in the presence of at least a catalytic amount of aluminum chloride, an unsaturated hydrocarbon feedstock mixture in the ratio of: one part by weight of (1) a vinyl aromatic stream having a boiling range of from 135° to 220° C. and which comprises from 3% to 10% styrene, from 2% to 6% α-methyl styrene, from 15% to 25% vinyl tolune, from 10% to 18% indene and from 4% to 12% methyl indenes; and from 0.3 to 1 part by weight of (2) oligomers of a cyclopentadiene stream which comprises 0.5 to 6 wt.% butadienecyclopentadiene, 2 to 8wt.% isoprene-cyclopentadiene codimer, 25 to 40wt.% dicyclopentadiene, 3 to 10wt.% piperylene-cyclopentadiene codimer, 25 to 40 wt.% cyclopentadiene-methylcyclopentadiene codimer and 2 to 8 wt.% methylcyclo-

pentadiene dimer; (b) quenching said polymerized hydrocarbon feedstock mixture to remove catalyst residues; and (c) finishing the washed polymerizate to provide a petroleum resin having a softening point of about 140° C. to about 160° C.

4,558,108

AQUEOUS SUSPENSION POLYMERIZATION PROCESS

Lupu Alexandru, Toronto, and Peter G. Odell, Mississauga, both of Canada, assignors to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 453,252, Dec. 27, 1982, abandoned. This application Oct. 9, 1984, Ser. No. 658,719
Int. Cl.⁴ C08F *2/18*

U.S. Cl. 526—340 **22 Claims**

1. A process for forming a copolymer of styrene and butadiene comprising providing an aqueous phase comprising an aqueous mixture comprising water, styrene monomer, butadiene monomer, a suspension stabilizing agent, and a chain propogating amount of a free radical polymerization initiator insoluble in water, soluble in said styrene monomer, soluble in said butadiene monomer and having a 1 hour half-life between about 50° C. and about 130° C., the ratio of said styrene monomer and said butadiene monomer being between about 80:20 and about 95:5 by weight, the weight proportion of water to the combination of said styrene monomer and said butadiene monomer is between about 08:1 and about 2:1, said suspension stabilizing agent consisting essentially of a finely-divided, difficultly water-soluble powder and a vapour phase comprising an inert gas and butadiene monomer, heating said aqueous phase and said vapor phase to a temperature between about 50° C. and about 130° C. at a pressure between about 20 psi and about 140 psi in the absence of redox initiators and mercaptan compounds, removing butadiene monomer from said vapour phase after at least about 75 percent by weight of said butadiene monomer and said styrene monomer in said aqueous phase are converted to a copolymer and prior to conversion of more than about 98 percent by weight of said butadiene monomer and said styrene monomer to a copolymer in said aqueous phase, and heating said aqueous phase at a temperature between about 50° C. and about 130° C. at a pressure between about 20 psi and about 140 psi until at least about 90 percent by weight of said sytrene monomer and said butadiene monomer are copolymerized to form an aqueous suspension of discrete copolymer particles having a Tg value of between about 45° C. and about 65° C., a weight average molecular weight of between about 10,000 and about 400,000, a molecular weight distribution of said copolymer between about 2 and about 9 and a butadiene monomer concentration of less than about 10 parts per million by weight.

4,558,109

CURABLE ORGANOPOLYSILOXANE COMPOSITIONS

Richard C. McAfee, Tecumseh, Mich., assignor to SWS Silicones Corporation, Adrian, Mich.

Filed Jul. 25, 1984, Ser. No. 634,244
Int. Cl.⁴ C08L *83/06*

U.S. Cl. 528—15 **28 Claims**

1. An organopolysiloxane composition which forms an elastomer at an elevated temperature comprising:

(a) An organopolysiloxane having an average of at least two hydroxyl groups per molecule;

(b) an organosilicon compound containing aliphatic unsaturation and having an average of at least two hydrolyzable groups per molecule, said hydrolyzable groups are linked to a silicon atom of the organosilicon compound and are selected from the group consisting of acyloxy groups, aminoxy groups, amine groups, acylamine groups, oxime groups, mixtures and partial hydrolyzates thereof having 2 to 10 silicon atoms per molecule;

(c) an organohydrogenpolysiloxane having an average of at least one silicon-bonded hydrogen atom per molecule;

(d) a platinum catalyst; and

(e) from 0 to 8 percent by weight based on the weight of the organopolysiloxane of a condensation catalyst

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4,558,110

CRYSTALLINE SILICONE-IMIDE COPOLYMERS

Chung J. Lee, Ballston Lake, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed Feb. 1, 1985, Ser. No. 697,309
Int. Cl.⁴ C08G *77/04*

U.S. Cl. 528—26 **36 Claims**

1. A crystalline silicone-imide copolymer composition comprising at least one imide-disiloxane block, wherein the imide portion of said imide-disiloxane block contains a symmetrical aromatic radical as its nucleus, and at least one polydiorganosiloxane block wherein said polydiorganosiloxane block has at least about five siloxy units.

4,558,111

METHOD FOR PREPARING ACRYLIC FUNCTIONAL HALOSILANES AND HALOSILOXANES

Luisito A. Tolentino, Ballston Lake, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed Dec. 5, 1984, Ser. No. 678,321
Int. Cl.⁴ C08G *77/04*

U.S. Cl. 528—26 **10 Claims**

1. A method for making acrylate-functional halosilanes or halosiloxanes, comprising reacting an organic acrylate and halosilane or halosiloxane having at least one silicon-bonded hydrogen atom in the presence of a hydrosilation catalyst and an amount of inhibitor effective for inhibiting the thermal free radical polymerization of said organic acrylate.

4,558,112

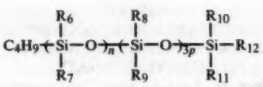
LOW OILING GEL FILLED ARTICLES, SILOXANE GELS AND LIQUIDS THEREFOR, AND METHODS FOR PRODUCING SAME

Thomas D. Talcott, Irvine, Calif., assignor to Boehringer Mannheim Corporation, Indianapolis, Ind.

Filed Jun. 5, 1981, Ser. No. 270,867
Int. Cl.⁴ C08G *77/12*

U.S. Cl. 528—31 **23 Claims**

1. An essentially polyfunctional polydiorganosiloxane compound comprising:



in which:

R_6 and R_7 are alkyl radicals having from 1 to about 6 carbon atoms;

n is an integer between about 50 and about 400, each R_6 and R_7 being independently selected for each of the n groups;

R_8 is an alkyl radical having from 1 to about 6 carbon atoms;

R_9 is an alkylene radical having from 2 to about 6 carbon atoms;

p is an integer from 1 to about 20, each R_8 and R_9 being independently selected for each of the p groups, the n and p groups being randomly interspersed along the compound provided that the p groups appear together in multiples of 3; and

R_{10}, R_{11} and R_{12} are selected from the group consisting of: an alkylene radical having from 2 to about 6 carbon atoms, and an alkyl radical having from 1 to about 6 carbon atoms.

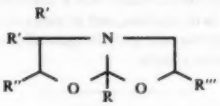
4,558,113

COPOLYMERS OF BICYCLIC AMIDE ACETALS AND POLYISOCYANATES

Anil B. Goel, Worthington, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.

Filed Mar. 11, 1985, Ser. No. 710,651
Int. Cl.[4] C08G *18/38*
U.S. Cl. 528—59 **19 Claims**

1. The process for preparing polymers having improved physical properties comprising polymerizing a mixture of (A) a bicyclic amide acetal component and (B) a polyisocyanate component said bicyclic amide acetal component conforming to the Formula



and being composed of both types (1) and (2), type (1) being characterized in that R, R′, R″ and R‴ independently represent hydrogen or a hydrocarbon group having no more than 2 carbon atoms and type (2) being characterized in that R, R′, R″ and R‴ represent hydrogen or an alkyl, aryl or an alkaryl group having from 1 to 18 carbon atoms and R‴ also represents an alkyl ether group having from 2 to 18 carbon atoms or an aryl ether group having from 7 to 13 carbon atoms and wherein at least one of R, R′, R″ and R‴ is a group having at least 7 carbon atoms.

4,558,114

POLYMERS DERIVED FROM POLYISOCYANATES, BICYCLIC AMIDE ACETALS AND OXAZOLINES

Anil B. Goel, Worthington, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.

Filed Jan. 23, 1985, Ser. No. 693,953
Int. Cl.[4] C08G *18/38*
U.S. Cl. 528—73 **19 Claims**

1. The process for preparing a tough, high-softening polymer comprising interpolymerizing a bicyclic amide acetal, an oxazoline and a polyisocyanate at a temperature in the range of from about room temperature up to about 200° C. and at a pressure in the range of from about atmospheric up to about 100 atmospheres.

4,558,115

THERMOSETTABLE RESIN COMPOSITIONS CONTAINING A POLYEPOXIDE AND AN ALKENYL PHENYL CYANATE

Robert E. Hefner, Jr., Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 639,034, Aug. 9, 1984, abandoned. This application Mar. 11, 1985, Ser. No. 710,356
Int. Cl.[4] C08G *59/40, 59/46, 73/08*
U.S. Cl. 528—92 **42 Claims**

1. A composition which comprises

(A) from about 1 to about 99 percent by weight of at least one alkenyl phenyl cyanate;

(B) from about 1 to about 99 percent by weight of at least one material having an average of more than one vicinal epoxide group per molecule;

(C) from zero to about 98 percent by weight of at least one aromatic polycyanate;

(D) from zero to about 50 percent by weight of at least one polymaleimide; and

(E) from about zero to about 98 percent by weight of at least one polymerizable ethylenically unsaturated aromatic material.

4,558,116

PROCESS FOR PREPARING RELATIVELY HIGH MOLECULAR WEIGHT EPOXY RESINS

Walter L. Wernli, Angleton, and Robert P. Shirtum, Freeport, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 4, 1985, Ser. No. 707,976
Int. Cl.[4] C08G *59/06*
U.S. Cl. 528—95 **18 Claims**

1. In a process for preparing relatively low molecular weight epoxy resins by reacting at least one polyhydric phenol with an excess of at least one epihalohydrin in the presence of an alcohol and an alkali metal hydroxide followed by dehydrohalogenation of the resultant halohydrin intermediate; the improvement which comprises

(1) employing a secondary alcohol as the alcohol;

(2) terminating the reaction between the polyhydric phenol and the epihalohydrin when from about 45 to less than about 70 percent of the phenolic hydroxyl groups have reacted and removing the unreacted epihalohydrin therefrom thereby producing a halohydrin intermediate product;

(3) removing unreacted polyhydric phenol from the resultant halohydrin intermediate product such that the concentration of phenolic hydroxyl-containing material therein is less than about 4, preferably less than about 1 percent by weight;

(4) dehydrohalogenating the product from step (3) with a suitable dehydrohalogenating agent; and

(5) recovering from step (4) a glycidyl ether of a polyhydric phenol containing less than about 1500 ppm total aliphatic halogen by weight.

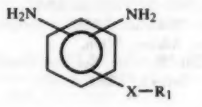
4,558,117

ORGANIC SOLVENT-SOLUBLE PHOTOSENSITIVE POLYIMIDE RESIN

Tsunetomo Nakano; Hiroshi Yasuno, and Kazuaki Nishio, all of Ichihara, Japan, assignors to UBE Industries, Ltd., Yamaguchi, Japan

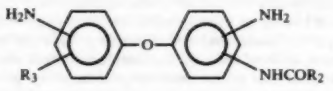
Filed May 30, 1984, Ser. No. 615,309
Claims priority, application Japan, May 30, 1983, 58-95566
Int. Cl.[4] C08G *73/10, 73/12*
U.S. Cl. 528—184 **7 Claims**

1. An organic solvent-soluble photosensitive polyimide resin comprising a copolycondensation product of an aromatic tetracarboxylic acid component consisting of at least one member selected from the group consisting of biphenyltetracarboxylic acids and dianhydrides, esters and salts thereof with an aromatic diamine component consisting of 40 to 90 molar % of at least one aromatic diamine compound of the formula (I):



(I)

and 10 to 60 molar % of at least one aromatic diamine compound of the formula (II):



(II)

in which formulae (I) and (II) X represents a divalent radical selected from the group consisting of —CO—O— and —CH$_2$—O—, R_1 and R_2 respectively represent, independently from each other, an organic residue having an ethylenically unsaturated radical, and R_3 represents a member selected from the

group consisting of a hydrogen atom and radicals of the formula —$NHCOR_2$, wherein R_2 is the same as defined above.

4,558,118

TWO PHASE INTERFACIAL POLYCONDENSATION POLYCARBONATE PROCESS

Subhas K. Sikdar, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jul. 20, 1984, Ser. No. 632,995
Int. Cl.[4] C08G *63/62*
U.S. Cl. 528—196 **18 Claims**

1. A method of producing aromatic polycarbonate by an interfacial polycondensation polycarbonate process comprising:

(A) forming an agitated two-phase admixture comprising
  (1) an inert organic solvent phase and
  (2) an aqueous phase containing a strong base having a pH above 11, the volume ratio of the organic phase to aqueous pahse being within the range of 0.04:1 to 0.20:1;
(B) adding an aromatic dihydroxy compound to the agitated two-phase admixture in 2 or more increments sufficient to maintain the mole ratio of strong base to aromatic dihydroxy compound above about 3.5;
(C) adding a carbonyl halide following each incremental addition of aromatic dihydroxy compound and reacting said carbonyl halide with the aromatic dihydroxy compound within said agitated two-phase admixture and
(D) recovering solid aromatic polycarbonate from the aqueous phase.

4,558,119

PROCESS FOR POLYMERIZATION OF 2,6-DISUBSTITUTED PHENOL

Izumi Yamashita, Yokohama, and Kunio Toyama, Sodegaura-machi, both of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jun. 22, 1984, Ser. No. 623,501
Claims priority, application Japan, Jun. 28, 1983, 58-116498
Int. Cl.[4] C08G *65/44*
U.S. Cl. 528—215 **7 Claims**

1. A process for oxidative polymerization of 2,6disubstituted phenol, which comprises coupling a 2,6-disubstituted phenol with an oxygen containing gas in the presence of a catalyst comprising a manganese compound, an N-alkylalkanolamine and a basic compound selected from the hydroxides, alkoxides and phenoxides of a metal from group IA of the periodic table.

4,558,120

DENSE STAR POLYMER

Donald A. Tomalia, Midland, and James R. Dewald, Bay City, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 456,226, Jan. 7, 1983, Pat. No. 4,507,466. This application Dec. 27, 1983, Ser. No. 565,686
Int. Cl.[4] C08G *69/00*
U.S. Cl. 528—363 **19 Claims**

1. A star polymer having at least one core branch emanating from a core, each core branch having at least one terminal group provided that (1) the ratio of terminal groups to the branches emanating from the core is two or greater, (2) the density of terminal groups in the polymer is at least 1.5 times that of a conventional star polymer having similar core and monomeric moieties and a comparable molecular weight and number of core branches wherein each of such branches of the conventional star polymer bears only one terminal group, and (3) a molecular volume that is equal to or less than 60 percent of the molecular volume of said conventional star polymer.

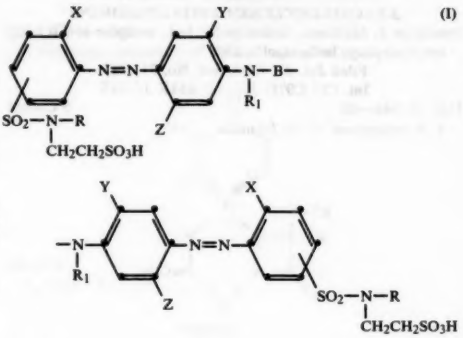
4,558,121

SULFOETHYLAMINOSULFONYL SUBSTITUTED DISAZO DYES

Alfred Fasciati, Bottmingen, and Arthur Bühler, Rheinfelden, both of Switzerland, assignors to Ciba Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 932,972, Aug. 11, 1978, abandoned. This application Oct. 23, 1980, Ser. No. 199,790
Claims priority, application Luxembourg, Aug. 22, 1977, 78008; Aug. 22, 1977, 78007
Int. Cl.[4] C09B *35/26, 62/83;* D06P *3/24, 3/26*
U.S. Cl. 534—641 **7 Claims**

1. A disazo dye which in the form of the free acid has the formula I



(I)

wherein

each R independently of the other represents hydrogen or alkyl of 1 to 4 carbon atoms,
each R_1 independently of the other represents hydrogen, methyl, ethyl, hydroxyethyl or cyanoethyl,
each X independently of the other represents hydrogen, halogen, or alkyl or alkoxy each of 1 to 4 carbon atoms,
each Y independently of the other represents hydrogen or alkoxy of 1 to 4 carbon atoms,
each Z independently of the other represents hydrogen, acylamino or alkyl or alkoxy each of 1 to 4 carbon atoms, and
B represents carbonyl or thiocarbonyl.

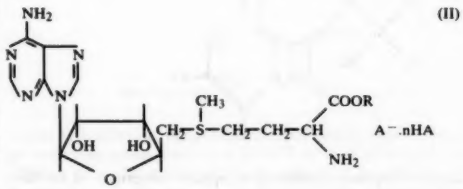
4,558,122

STABLE S-ADENOSYLMETHIONINE DERIVATIVES, THE PROCESS FOR THEIR PREPARATION, AND THERAPEUTIC COMPOSITIONS WHICH CONTAIN THEM AS ACTIVE PRINCIPLE

Federico Gennari, Truccazzano, Italy, assignor to Bioresearch S.P.A., Milan, Italy

Filed Sep. 2, 1982, Ser. No. 414,044
Claims priority, application Italy, Sep. 11, 1981, 23940 A/81
Int. Cl.[4] C07H *15/12, 17/00*
U.S. Cl. 536—26 **10 Claims**

1. S-adenosylmethionine (SAM) derivatives of formula:



(II)

in which R is a linear or branched aliphatic radical containing 1 to 6 carbon atoms, A is an equivalent of a generic anion of a strong inorganic or organic acid of pK<2.5 and n can vary from 0 to 4.

7. A composition for the treatment of hyperlipemia comprising an antihyperlipemic effective amount of the compound of claim 1 and a therapeutically acceptable carrier.

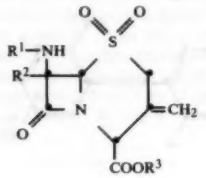
4,558,123

3-EXOMETHYLENE CEPHALOSPORINS

Lawrence J. McShane, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Jul. 22, 1983, Ser. No. 516,215
Int. Cl.⁴ C07D *501/22;* **A61K** *31/545*
U.S. Cl. 544—16 **5 Claims**

1. A compound of the formula



wherein:

R^1 is an acyl residue of a carboxylic acid;

R^2 is hydrogen, lower alkoxy or lower alkylthio; and

R^3 is a removable ester forming group.

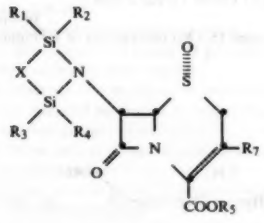
4,558,124

PREPARATION OF CEPHALOSPORIN INTERMEDIATE COMPOUNDS

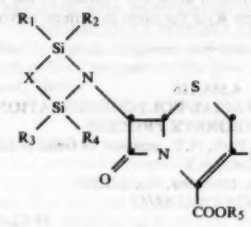
John R. Corfield, Runcorn, and Andrew S. Miller, Marple, both of England, assignors to Lilly Industries Limited, London, England

Filed May 26, 1983, Ser. No. 498,234
Claims priority, application United Kingdom, May 26, 1982, 8215418
Int. Cl.⁴ C07D *501/24;* **A61K** *31/545*
U.S. Cl. 544—22 **2 Claims**

1. A process for preparing a compound of the formula



which comprises combining a cephem compound of the formula:



with a peracid oxidising agent and a sufficient amount of base so as to maintain the pH of the process from between about seven to about thirteen; and wherein:

R_1, R_2, R_3 and R_4 are the same or different and are chosen from the group consisting of C_1 to C_4 alkyl, C_1 to C_4 alkoxy, phenyl, and phenyl substituted with from one to three C_1 to C_4 alkyl, nitro, halo and C_1 to C_4 alkoxy groups, R_7 is methyl, halo, halomethyl or acetoxymethyl; and

X is an alkylene group of the formula:

$$-(CH_2)_n-$$

wherein n is an integer from one through five.

4,558,125

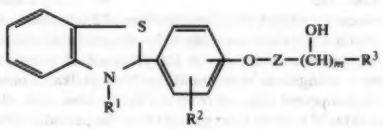
BENZOTHIAZOLINE COMPOUNDS WHICH CONTAIN A CARBONYL GROUP USEFUL FOR TREATING CARDIOVASCULAR DISEASE

Jun-ichi Iwao, Takarazuka; Tadashi Iso, Sakai, and Masayuki Oya, Ibaraki, all of Japan, assignors to Santen Pharmaceutical Co., Ltd., Osaka, Japan

Division of Ser. No. 503,160, Apr. 14, 1983, Pat. No. 4,479,949. This application May 21, 1984, Ser. No. 612,323
Claims priority, application Japan, Sep. 12, 1981, 56-144148
Int. Cl.⁴ C07D *417/00, 413/00*
U.S. Cl. 544—135 **11 Claims**

1. A compound of the formula (I) and salts thereof,

(I)



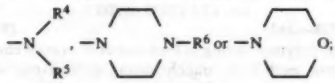
wherein

R^1 is lower alkanoyl;

R^2 is one to three groups selected from hydrogen, lower n-alkyl, lower n-alkoxy, hydroxy, chloro, bromo, nitro, halogeno-lower alkyl and sulfamoyl;

R^3 is $—COR^8$;

R^8 is hydroxy, lower alkoxy,



R^4 and R^5, which may be same or different, each is hydrogen, lower alkyl, cyclohexyl or substituted lower alkyl, said substituted lower alkyl has at least one substituent selected from the group consisting of hydroxy, phenyl, pyridyl, piperidyl and phenylcarbonyl, and said phenyl nucleus may be substituted by one to three groups selected from lower n-alkyl, hydroxy, chloro, bromo, lower n-alkoxy, nitro, cyano, acetamino and lower n-alkylamino;

R^6 is hydrogen, alkyl having 1 to 8 carbon atoms, alkanoyl having 2 to 8 carbon atoms, alkenoyl having 2 to 8 carbon atoms or furylcarbonyl, each of which alkyl, alkanoyl and alkenoyl may be substituted by one to three groups selected from hydroxy, phenyl and phenylcarbonyloxy, and said phenyl nucleus may be substituted by one to three groups selected from lower n-alkyl, hydroxy, chloro, bromo, lower n-alkoxy, nitro, cyano, acetamino and lower n-alkylamino;

Z is straight or branched alkylene having 1 to 6 carbon atoms;

m is 0 or 1;

wherein the terms lower alkyl, lower alkoxy and lower alkanoyl refer to groups having 1 to 6 carbon atoms.

11. A method of treatment for cardiovascular diseases which comprises administering a composition comprising a compound as in claim 1 and at least one pharmaceutically acceptable excipient.

4,558,126

METHOD OF PREPARING URACIL

Hermann Peeters, Niederkassel, and Wilhelm Vogt, Cologne, both of Fed. Rep. of Germany, assignors to Dynamit Nobel AG, Troisdorf, Fed. Rep. of Germany

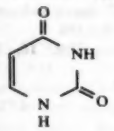
Filed Nov. 16, 1984, Ser. No. 672,342

Claims priority, application Fed. Rep. of Germany, Nov. 24, 1983, 3342419

Int. Cl.⁴ C07D *239/54*

U.S. Cl. 544—309 **10 Claims**

1. A method of preparing uracil

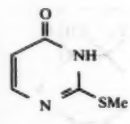


(1)

comprising reacting an alkali formyl acetic alkyl ester

MeO—CH=CH—COOR (2)

wherein Me represents an alkali metal, preferably sodium or potassium, and R represents an alkyl moiety of 1 to 8 carbon atoms, with thiourea to form an alkali salt of 2-mercapto-4-hydroxypyrimidine



(3)

wherein Me has the same meaning as in Formula 2; reacting without isolation, the alkali salt with hydrogen peroxide in aqueous solution, in the presence of at least 2 moles of base, and acidifying to a pH of 6 or less.

4,558,127

5-FLUOROURACIL NITROXYL DERIVATIVES POSSESSING ANTITUMOR ACTIVITY

Nikolai M. Emanuel, ulitsa Kosygina, 6, kv. 44, Moscow; Albina N. Rozenberg, Shkoln bulvar, 7, kv. 97, Moskovskaya oblast, p.o. Chernogolovka; Valery A. Golubev, Institutsky prospekt, 6, kv. 115, Moskovskaya oblast, p.o. Chernogolovka; Gennady N. Bogdanov, ulitsa Pervaya, 19/1, kv. 11, Moskovskaya oblast, p.o. Chernogolovka; Ljubov S. Vasilieva, ulitsa Tsentralnaya, 4, kv. 9, Moskovskaya oblast, p.o. Chernogolovka, and Nina P. Konovalova, ulitsa Dmitria Ulyanova, 4, korpus 2, kv. 339, Moscow, all of U.S.S.R.

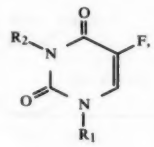
PCT No. PCT/SU84/00013, § 371 Date Oct. 17, 1984, § 102(e) Date Oct. 17, 1984, PCT Pub. No. WO84/03510, PCT Pub. Date Sep. 13, 1984

PCT Filed Mar. 7, 1984, Ser. No. 666,623

Int. Cl.⁴ C07D *239/10, 207/20*

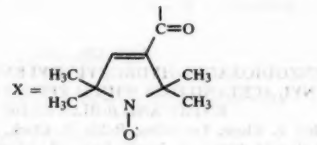
U.S. Cl. 544—310 **1 Claim**

1. Nitroxyl compound of 5-fluorouracyl of the formula:



wherein

$R_1=R_2=X$,



or $R_1=X$, $R_2=H$,

or $R_1=H$, $R_2=X$,

or $R_1=Na$, $R_2=X$,

possessing an antitumor activity.

4,558,128

2-SUBSTITUTED ALKYLAMINOPYRIMIDONES

Charon R. Ganellin, Welwyn; Robert J. Ife, Stevenage, and David A. A. Owen, Welwyn Garden City, all of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

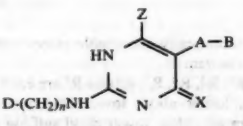
Division of Ser. No. 290,628, Aug. 6, 1981, which is a division of Ser. No. 56,171, Jul. 10, 1979, Pat. No. 4,305,945. This application Nov. 9, 1983, Ser. No. 549,953

Claims priority, application United Kingdom, Jul. 15, 1978, 7829999

Int. Cl.⁴ C07D *239/02, 403/00*

U.S. Cl. 544—320 **2 Claims**

1. A compound of the formula



where D is chlorine, bromine, iodine, toluene-p-sulphonyloxy or methanesulphonyloxy; n is from 3 to 8; X is oxygen or sulphur; Z is hydrogen or lower alkyl; A is straight or branched C_1–C_5 alkylene or $—(CH_2)_pW(CH_2)_q—$ where W is

oxygen or sulphur and the sum of p and q is 1 to 4; and B is methyl, C_3–C_6 cycloalkyl, a heteroaryl group selected from pyridyl, N-oxopyridyl, furyl, thienyl, thiazolyl, oxazolyl, isothiazolyl, imidazolyl, pyrimidyl, pyrazyl, pyridazyl, thiadiazolyl, quinolyl, isoquinolyl, 5,6,7,8-tetrahydroquinolyl, 1,3-dioxolopyridyl, benzimidazolyl and benzthiazolyl, said heteroaryl group being optionally substituted by one or more lower alkyl, lower alkoxy, halo, hydroxy or amino groups or B is a naphthyl, 5- or 6-(2,3-dihydro-1,4-benzodioxinyl) or 4- or 5-(1,3-benzodioxolyl) group, or a phenyl group optionally substituted with one, two or three lower alkoxy or one or two lower alkyl, halogen, phenyl(lower alkoxy), hydroxy, lower alkoxy-lower alkoxy, trifluoromethyl, di(lower alkyl)amino, phenoxy, halophenoxy, lower alkoxyphenoxy, phenyl, halophenyl or lower alkoxyphenyl group, or, provided A is methylene, B can be hydrogen, in the form of the free base or a pharmaceutically acceptable acid addition salt thereof.

4,558,129

BENZODIOXANYL-HYDROXYETHYLENE-PIPERAZINYL ACETANILIDES WHICH EFFECT CALCIUM ENTRY AND β-BLOCKADE

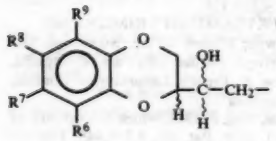
Arthur F. Kluge, Los Altos; Robin D. Clark, Palo Alto, and Arthur M. Strosberg, Menlo Park, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed May 18, 1983, Ser. No. 495,870

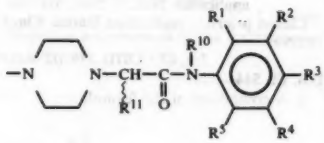
Int. Cl.⁴ C07D *405/06, 405/12;* **A61K** *31/495*

U.S. Cl. 544—377 **13 Claims**

1. A compound of the formula:



(I)



and the pharmaceutically acceptable esters and acid addition salts thereof, wherein:

R^1, R^2, R^3, R^4, R^5, R^6, R^7, R^8 and R^9 are each independently hydrogen, lower alkyl, lower alkoxy, trifluoromethyl, halo, lower alkylthio, lower alkyl sulfinyl or lower alkyl sulfonyl; or

R^2 and R^3 together form —OCH_2O—; and

R^{10} and R^{11} are each independently hydrogen or lower alkyl.

4,558,130

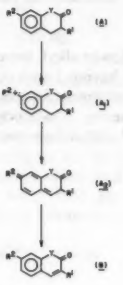
FLUOROGENIC DIHYDROQUINOLONE AND DIHYDROCOUMARIN INDICATORS FOR HYDROGEN PEROXIDE

Robert T. Buckler, Edwardsburg, Mich., and Robert P. Hatch, Elkhart, Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

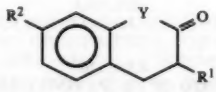
Filed Mar. 27, 1984, Ser. No. 594,242

Int. Cl.⁴ C09B *23/04*

U.S. Cl. 546—66 **12 Claims**



1. A compound of the formula:



wherein R^1 is hydrogen, alkyl, alkenyl, aryl, or an electron withdrawing group; R^2 is hydroxyl or —NR^3R^4 where R^3 and R^4, which can be the same or different, are hydrogen, alkyl, alkenyl, or aryl; and Y is =O or =N—R^5 where R^5 is hydrogen or lower alkyl.

4,558,131

COLOR-PHOTOGRAPHIC RECORDING MATERIAL

David G. Leppard, Marly, and Jean Rody, Riehen, both of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

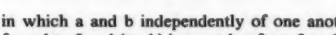
Filed Dec. 15, 1983, Ser. No. 562,188

Claims priority, application Switzerland, Dec. 16, 1982, 7316/82

Int. Cl.⁴ C07D *211/50*

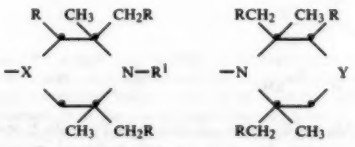
U.S. Cl. 546—222 **4 Claims**

1. A compound of the formula



(I)

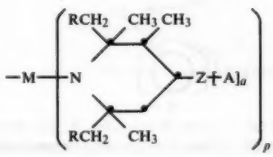
in which a and b independently of one another are integers from 1 to 5 and (a+b) is a number from 2 to 6, A is a monovalent hydroquinone monoether or resorcinol monoether radical, the free OH group of which is sterically hindered, Z is an (a+b)-valent organic radical linking groups A and B and B is a monovalent polyalkylpiperidine radical of the formula II or III



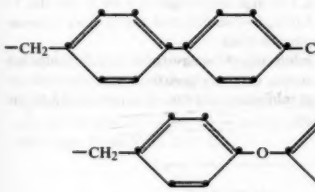
(II) (III)

in which R is hydrogen or methyl, X is a group

or a 5-membered or 6-membered heterocyclic spiro ring with two O or N atoms, Y is a group $—CH_2—$ or $—CH(R^2)—$ or a 5-membered or 6-membered heterocyclic spiro ring with two O or N atoms, R^1 is hydroxyl, C_1–C_{12}-alkyl, C_3–C_6-alkenyl, C_3–C_4-alkynyl, C_7–C_{12}-phenylalkyl, glycidyl, C_1–C_4-alkyl which is substituted by halogen, —CN, $—COOR^3$ or $—CON(R^4)(R^5)$, a group $—CO—R^6$, $—CO—OR^3$, $—CO—N(R^4)(R^5)$, $—CH_2—CH(R^7)—OR^8$, $—SO—R^9$, $—SO_2—R^9$, $—OR^3$ or $—OOC—R^6$, or a group $—Z^o—A$, in which Z^o is a divalent organic radical, and, if b is 1, R^1 can also be a group of the formula



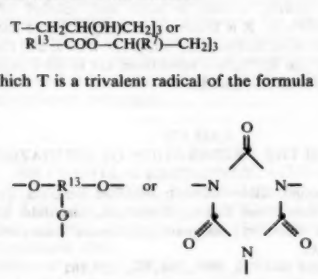
in which p is 1, 2 or 3 and, if p is 1, M is a divalent group and is C_2–C_{12}-alkylene, C_4–C_8-alkenylene, xylylene or a radical of the formula $—CH_2C{\equiv}C—CH_2—$)



$—CH_2—COO—R^{10}—OOC—CH_2—$, $—CH_2—CH(OH)—CH_2—$, $—CH_2CH(OH)CH_2—D—CH_2CH(OH)CH_2—$, $—CH_2—CH(R^7)—OOC—R^{11}—COO—CH(R^7)—CH_2—$ or —CO—NH—G—NH—CO—, in which D is a divalent radical of the formula $—O—R^{12}—O—$ or $—OOC—R^{11}—COO—$ and G is a divalent aliphatic, cycloaliphatic, aromatic or aromatic-aliphatic radical having 6–15 C atoms, or, if p is 2, M is a trivalent radical of the formula

$$T—CH_2CH(OH)CH_2]_3 \text{ or } R^{13}—COO—CH(R^7)—CH_2]_3$$

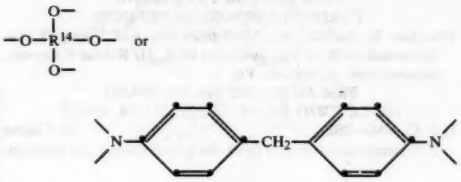
in which T is a trivalent radical of the formula



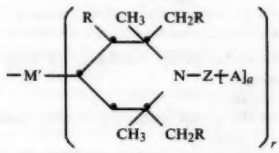
or, if p is 3, M is a quadrivalent radical of the formula

$$Q—CH_2CH(OH)CH_2]_4 \text{ or } R^{14}—COO—CH(R^7)—CH_2]_4$$

in which Q is a group of the formula



R^2 is hydroxyl, $—OR^{15}$, $—OOC—R^6$, $—OOC—N(R^4)(R^5)$, $—N(R^{16})—CO—R^6$ or $—N(R^{16})—CO—N(R^4)(R^5)$, or is a group $—Z^o—A$, and, if b is 1, R^2 can also be a group of the formula



in which r is 1, 2 or 3 and, if r is 1, M′ is a divalent group of the formula $—OOC—R^{11}—COO—$, $—OOC—NH—G—NH—COO—$, $—N(R^{16})—CO—R^{11}—CO—N—(R^{16})—$ or $—N(R^{17})—R^{18}—N(R^{17})—$, or, if r is 2, M′ is a trivalent group of the formula

$$R^{19}[COO]_3 \text{ or } R^{19}[CON(R^{16})]_3$$

or, if r is 3, M′ is a quadrivalent group of the formula

$$R^{20}[COO]_4 \text{ or } R^{20}[CON(R^{16})]_3$$

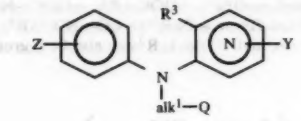
R^3 is C_1–C_{12}-alkyl, benzyl or cyclohexyl, R^4 is C_1–C_{12}-alkyl, allyl, cyclohexyl, benzyl or phenyl and R^5 is hydrogen, C_1–C_8-alkyl or allyl, or R^4 and R^5, together with the N atom, are a 5-membered or 6-membered heterocyclic ring, R^6 is hydrogen, C_1–C_{12}-alkyl, C_2–C_6-alkenyl, chloromethyl, C_5–C_{12}-cycloalkyl, C_7–C_{12}-phenylalkyl, phenyl, C_7–C_{10}-alkylphenyl, or phenyl, phenylmethyl or phenethyl which is substituted by 1 or 2 C_1–C_4-alkyl groups and a hydroxyl group, R^7 is hydrogen, C_1–C_4-alkyl, C_2–C_{13}-alkoxymethyl, phenyl or phenoxymethyl, R^8 is hydrogen, C_1–C_{12}-alkyl, $—CO—R^6$ or $—CO—N(R^4)(R^5)$, R^9 is C_1–C_{12}-alkyl, phenyl or C_7–C_{22}-alkylaryl, R^{10} is C_2–C_{12}-alkylene, C_4–C_8-oxaalkylene or cyclohexylene, R^{11} is a direct bond, C_1–C_{12}-alkylene, C_2–C_6-alkenylene, C_6–C_{12}-cycloalkylene or -cycloalkenylene or C_6–C_{12}-arylene, R^{12} is C_2–C_{12}-alkylene, C_6–C_{12}-cycloalkylene, C_6–C_{12}-arylene or -phenylene-W-phenylene- and W is —O—, $—CH_2—$, $>C(CH_3)_2$ or $—SO_2—$, R^{13} is a trivalent aliphatic hydrocarbon radical having 3–10 carbon atoms or a trivalent aromatic hydrocarbon radical having 6–10 C atoms, R^{14} is a quadrivalent aliphatic hydrocarbon radical having 4–10 C atoms or a quadrivalent aromatic hydrocarbon radical having 6–12 C atoms, R^{15} is hydrogen, C_1–C_{12}-alkyl, allyl or benzyl, R^{16} is hydrogen, C_1–C_{12}-alkyl, C_5–C_{12}-cycloalkyl or benzyl, R^{17} is hydrogen, C_1–C_{12}-alkyl, allyl, benzyl, C_2–C_{12}-alkanoyl or benzoyl, R^{18} is C_2–C_{12}-alkylene, C_4–C_{16}-alkylene which is interrupted by one or more —O— or $—N(R^{16})—$, or C_6–C_{12}-cycloalkylene, R^{19} is a trivalent aliphatic radical having 3–10 C atoms, a trivalent aromatic radical having 6–10 C atoms or the group $N(CH_2)_3$ and R^{20} is a quadrivalent aliphatic radical having 4–10 C atoms or a quadrivalent aromatic radical having 6–12 C atoms.

4,558,132
NITRO, AMINO AND AROYLAMINO-N-PHENYLPYRIDINAMINES IN A PROCESS FOR PREPARING PYRIDO[1,4]BENZODIAZEPINES

Chandler R. Taylor, Jr., Mechanicsville, and Young S. Lo, Richmond, both of Va., assignors to A. H. Robins Company, Incorporated, Richmond, Va.

Filed Jul. 2, 1982, Ser. No. 394,551
Int. Cl.[4] C07D *213/44, 211/72, 211/84, 409/00*
U.S. Cl. 546—262 **32 Claims**

1. A compound selected from the group having the formula:



wherein;

Q is selected from the group consisting of hydrogen, —NR[1]R[2] or halogen;

R^1 and R^2 are loweralkyl;

R^3 is selected from the group consisting of nitro, amino or aroylamino (ArCONH—);

Ar is selected from the group consisting of 2 or 3-thienyl, 2, 3 or 4 pyridinyl, phenyl or phenyl substituted by 1 to 3 radicals selected from halo, loweralkyl, loweralkoxy, trifluoromethyl, or nitro and may be the same or different;

alk[1] is a straight or branched hydrocarbon chain containing 1–8 carbon atoms;

Z is selected from the group consisting of hydrogen, halogen, loweralkyl, loweralkoxy or nitro;

Y is selected from the group consisting of hydrogen or 1–2 radicals selected from loweralkyl or loweralkoxy and may be the same or different;

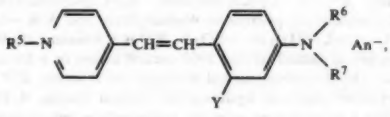
and the acid addition salts thereof.

4,558,133
P-(PYRIDINIUM-VINYL)-N,N-(DISUBSTITUTED-ANILINE SALTS FOR DYEING PAPER AND THEIR PREPARATION

Hermann Beecken, Bergisch Gladbach, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 21, 1980, Ser. No. 170,412
Claims priority, application Fed. Rep. of Germany, Aug. 8, 1979, 2932092
Int. Cl.[4] C09B *23/10, 23/16;* **D06P** *1/42;* **D21H** *1/46*
U.S. Cl. 546—329 **3 Claims**

1. A dyestuff of the formula



wherein

An^- is an anion,

R^5, R^6 and R^7 each independently is C_1- to C_4-alkyl, C_1- to C_4-alkyl substituted by phenyl, C_2- to C_4-alkyl substituted by hydroxyl, C_1- to C_4-alkoxy, phenoxy, benzyloxy, benzoyloxy, C_1- to C_3-alkylcarbonyloxy, chlorine or cyano, or C_3- or C_4-alkyl substituted by two hydroxyl or chlorine, it being possible for the various phenyl radicals to be substituted by one C_1- to C_4-alkoxy, C_6-cycloalkyl, benzyl, phenoxy, benzyloxy, or cyano radical or by one to three fluorine, chlorine or bromine atoms or C_1- to C_4-alkyl radicals,

at least one of the radicals R^5, R^6, or R^7 being C_1- to C_4-alkyl group which is substituted by phenyl or by one of the above-mentioned radicals containing a phenyl group or R^6 or R^7 represent phenyl, which is unsubstituted or substituted by the above mentioned radicals, and

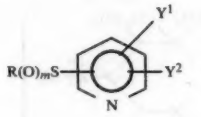
Y is hydrogen or methyl.

4,558,134
CERTAIN PHENOXY-PYRIDINE-CARBONITRILES HAVING ANTIVIRAL ACTIVITY

Yulan C. Tong, Walnut Creek, Calif., assignor to The Dow Chemical Company, Midland, Mich.

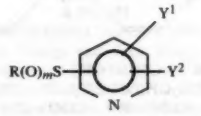
Filed Jan. 3, 1983, Ser. No. 455,439
Int. Cl.[4] C07D *213/57;* **A61K** *31/44*
U.S. Cl. 514—344 **72 Claims**

1. A compound of the formula:



wherein Y^1 is cyano; Y^2 is substituted phenoxy or unsubstituted phenoxy wherein said substituted phenoxy moiety is a phenoxy group mono-substituted with a benzoyl radical or substituted with from 1 to 3 substituents selected from the group consisting of fluoro, chloro, bromo, or iodo; and, relative to the $R(O)_mS$— substituent, R is lower alkyl of from 1 to 6 carbon atoms, both inclusive, and m is the integer 0, 1, or 2; and the Y^2 substituent and the $R(O)_mS$— substituent are in para orientation with respect to one another.

27. A method for inhibiting picornaviruses which comprises contacting picornaviruses or picornavirus host cells with an effective picornavirus inhibiting amount of a compound of the formula:



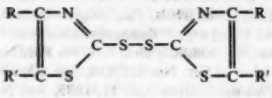
wherein Y^1 is cyano; Y^2 is substituted phenoxy or unsubstituted phenoxy wherein said substituted phenoxy moiety is a phenoxy group mono-substituted with a benzoyl radical or substituted with from 1 to 3 substituents selected from the group consisting of fluoro, chloro, bromo, or iodo; and, relative to the $R(O)_mS$— substituent, R is lower alkyl of from 1 to 6 carbon atoms, both inclusive, and m is the integer 0, 1, or 2; and the Y^2 substituent and the $R(O)_mS$— substituent are in para orientation with respect to one another.

4,558,135
PROCESS FOR THE PREPARATION OF DITHIAZOLYL DISULFIDES

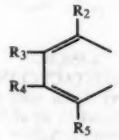
Hans-Georg Zengel, Kleinwallstadt; Manfred Bergfeld, Erlenbach/Mechenhard, and Ludwig Eisenhuth, Elsenfeld, all of Fed. Rep. of Germany, assignors to Akzona Incorporated, Asheville, N.C.

Filed Nov. 23, 1981, Ser. No. 324,181
Claims priority, application Fed. Rep. of Germany, Apr. 2, 1981, 3113298
Int. Cl.[4] C07D *277/70*
U.S. Cl. 548—158 **8 Claims**

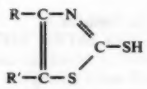
1. In a process for the preparation of dithiazolyl-(2,2′)-disulfides of the formula



wherein R and R′ may be the same or different, and represent a hydrogen atom, a halogen atom, a nitro group, a hydroxyl group, an alkyl or alkoxy radical with 1 to 6 carbon atoms, a cycloalkyl or aryl radical with 6 to 12 carbon atoms, wherein said alkyl, alkoxy, cycloalkyl or aryl radical are substituted with at least one substituent selected from the group consisting of a halogen atom, a nitro group, a hydroxyl group, and an alkyl or alkoxy radical with 1 to 5 carbon atoms; or R an R′ jointly may form the radical



whereby R_2, R_3, R_4, and R_5 may be the same or different and have the same meaning as R and R′, by means of the catalytic oxidation of a 2-mercaptothiazole of the formula



in which R and R′ are as set forth above, by means of oxygen or an oxygen containing gas, the improvement consisting essentially of reacting said 2-mercaptothiazole in the presence of a catalytic amount of ammonia and a solvent at temperatures in the range from 0° to 150° C.

4,558,136

PREPARATION OF 2-BENZOXAZOLINONES

Alan W. White, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 487,930, Apr. 22, 1983, abandoned. This application Jun. 21, 1985, Ser. No. 746,949

Int. Cl.[4] C07D *263/56*

U.S. Cl. 548—221 **9 Claims**

1. Process for the preparation of 2-benzoxazolinones by reacting a 2-nitrophenol compound with carbon monoxide at elevated temperature and pressure in the presence of a catalytic amount of an unsupported palladium catalyst selected from the group consisting of palladium chloride and palladium acetate and at least one mole of a tertiary amine per mole of 2-nitrophenol compound.

4,558,137

BIS PHENYL (2 CARBOXYLIC ACID OR ESTER INDOL-3-YL)METHANES

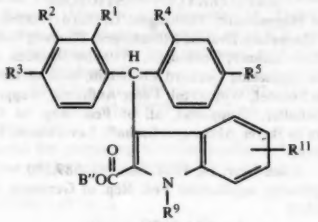
Paul J. Schmidt, Sharonville, and William M. Hung, Cincinnati, both of Ohio, assignors to The Hilton-Davis Chemical Co., Cincinnati, Ohio

Division of Ser. No. 290,657, Aug. 6, 1981, Pat. No. 4,403,791. This application Jun. 6, 1983, Ser. No. 501,309

Int. Cl.[4] C07D *209/42*

U.S. Cl. 548—492 **2 Claims**

1. A [(2—R^1—3—R^2—4—R^3—phenyl)(2—R^4—4—R^5-phenyl)(1—R^9—2B″O—5/6—R^{11}-indol-3-yl)]methane having the formula



wherein:

R^1 represents hydrogen, C_1 to C_3 alkyl, non-tertiary C_1 to C_4 alkoxy, halo or dialkylamino in which alkyl is non-tertiary C_1 to C_4 alkyl;

R^2 represents hydrogen or nitro;

R^3 represents hydrogen, C_1 to C_3 alkyl, non-tertiary C_1 to C_4 alkoxy, halo, dialkylamino or N-alkylbenzylamino in which alkyl is non-tertiary C_1 to C_4 alkyl and benzyl may be substituted in the benzene ring by one or two of halo or C_1 to C_3 alkyl;

R^4 represents hydrogen, non-tertiary C_1 to C_4 alkyl, non-tertiary C_1 to C_4 alkoxy, halo or dialkylamino in which alkyl is non-tertiary C_1 to C_4 alkyl;

R^5 represents dialkylamino or N-alkylbenzylamino in which alkyl is non-tertiary C_1 to C_4 alkyl and benzyl may be substituted in the benzene ring by one or two of halo or C_1 to C_3 alkyl;

R^9 represents hydrogen, C_1 to C_{18} alkyl, C_2 to C_4 alkenyl, benzyl and benzyl substituted in the benzene ring by one or two of halo;

R^{11} represents one or two of hydrogen, C_1 to C_3 alkyl, C_1 to C_3 alkoxy, halo or nitro;

B″ represents hydrogen, C_2 to C_8 alkenyl, benzyl or benzyl substituted in the benzene ring by one or two of halo or C_1 to C_3 alkyl.

4,558,138

CATALYTIC HYDROGENATION OF SULFOLENES

Marvin M. Johnson, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 29, 1985, Ser. No. 718,048

Int. Cl.[4] C07D *333/48*

U.S. Cl. 549—87 **19 Claims**

1. A process for purifying a sulfolene compound comprising the step of contacting said sulfolene compound, which contains dissolved SO_2, with at least one oxidizing agent selected from the group consisting of (a) peroxomonosulfuric acid, (b) peroxodisulfuric acid, (c) peroxomonosulfates and at least one acid having a pKa of less than 4, and (d) peroxodisulfates and at least one acid having a pKa of less than 4, under such conditions as to produce a sulfolene compound having a reduced level of dissolved SO_2; wherein said acid in (c) and (d) can be (a) or (b).

4,558,139
BAFILOMYCIN PESTICIDES

Hans-Paul Hagenmaier, Tuebingen; Gerhard Werner, Kusterdingen; Hannelore Drautz, Moessingen; Hartwig Holst, Pohlheim; Hans Zähner, Tuebingen; Wilhelm Brandes, Leichlingen; Paul Reinecke; Gerhard Zoebelein, both of Leverkusen; Wilhelm Stendel, Wuppertal; Peter Andrews, Wuppertal, and Klaus Schaller, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

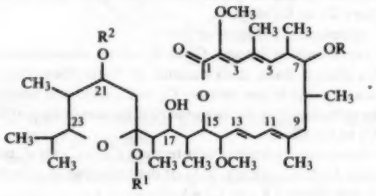
Filed Mar. 14, 1984, Ser. No. 589,380

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1983, 3310533

Int. Cl.⁴ C07D *407/06*

U.S. Cl. 549—271 **16 Claims**

1. Bafilomycin of the formula

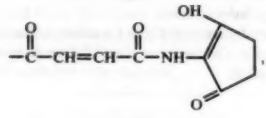


in which

R is hydrogen or the acyl radical of a carboxylic acid having one to six carbon atoms,

R^1 is hydrogen or CH_3, and

R^2 is hydrogen, the acyl radical of a carboxylic acid having one to six carbon atoms or the group



at least one of R and R^2 being the radical of a carboxylic acid acyl.

4,558,140
CYCLOPENTA[B]FURAN-2-ONES

David L. Coffen, Glen Ridge; George W. Holland, North Caldwell; Perry Rosen, North Caldwell, and Frederick Wong, Glen Ridge, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

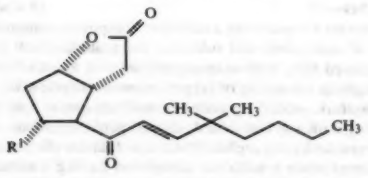
Filed Mar. 6, 1984, Ser. No. 586,586

Int. Cl.⁴ C07D *307/93*

U.S. Cl. 549—312 **9 Claims**

1. An optically active compound of the formula:

VI



wherein R^1 is hydrogen or lower alkyl; and its racemate.

4,558,141
PERFLUORODIOXOLE AND ITS POLYMERS

Edward N. Squire, Glen Mills, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 658,666, Oct. 9, 1984, Pat. No. 4,533,741, which is a division of Ser. No. 421,824, Sep. 23, 1982, Pat. No. 4,485,250. This application Apr. 11, 1985, Ser. No. 722,020

Int. Cl.⁴ C07D *317/00*

U.S. Cl. 549—455 **1 Claim**

1. A liquid, low molecular weight homopolymer of perfluoro-1,3-dioxole.

4,558,142
7-FLUORO-PROSTACYCLIN ANALOGS

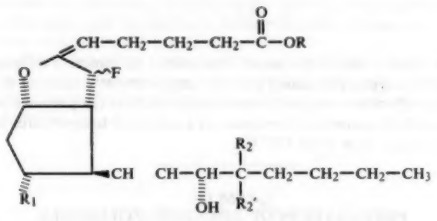
George W. Holland; Perry Rosen, both of North Caldwell, and Hans Maag, Upper Montclair, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 337,791, Jan. 7, 1982, abandoned, which is a continuation-in-part of Ser. No. 242,818, Mar. 11, 1981, abandoned. This application Sep. 7, 1982, Ser. No. 414,765

Int. Cl.⁴ C07D *307/935*

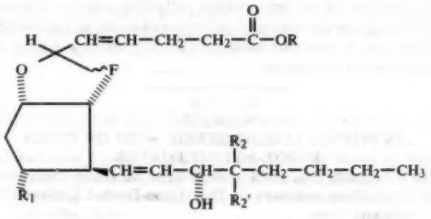
U.S. Cl. 549—465 **55 Claims**

1. A compound of the formula



wherein R is hydrogen or lower alkyl, R_1 is methyl, hydrogen, or hydroxy; R_2 is hydrogen, methyl or fluoro; and R_2' is hydrogen, fluoro, trifluoromethyl or methyl; with the proviso that when R_2' is trifluoromethyl, R_2 is hydrogen or methyl or their pharmaceutically acceptable salts, optical antipodes or racemates.

42. A compound of the formula:



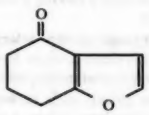
wherein R is hydrogen or lower alkyl, R_1 is methyl, hydrogen, or hydroxy; R_2 is hydrogen, methyl or fluoro; and R_2' is hydrogen, fluoro, trifluoromethyl or methyl; and with the proviso that when R_2' is trifluoromethyl, R_2 is hydrogen or methyl or their pharmaceutically acceptable salts, optical antipodes or racemates.

4,558,143
PROCESS FOR PREPARING 4-OXO-4,5,6,7-TETRAHYDROBENZOFURAN

Masakatsu Matsumoto, Sagamihara, and Nobuko Watanabe, Kamakura, both of Japan, assignors to Sagami Chemical Research Center, Tokyo, Japan

Filed Aug. 4, 1983, Ser. No. 520,519
Claims priority, application Japan, Aug. 6, 1982, 57-136231
Int. Cl.[4] C07D *307/79*
U.S. Cl. 549—471 1 Claim

1. A process for preparing 4-oxo-4,5,6,7-tetrahydrobenzofuran of the formula:



which comprises reacting 1,3-cyclohexanedione with a mixture of chloroacetaldehyde and a base selected from the group consisting of triethylamine, $NaHCO_3$, NaOH and K_2CO_3 or reacting chloroacetaldehyde with a mixture of 1,3-cyclohexanedione and said base while maintaining the resulting mixture at a pH of from 4 to 10 and treating the reaction mixture with an acid.

4,558,144
VOLATILE METAL COMPLEXES

Robert C. Fay, Ithaca, and David A. Thompson, Big Flats, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Oct. 19, 1984, Ser. No. 662,829
Int. Cl.[4] C07F *3/06*
U.S. Cl. 556—40 3 Claims

1. The complex: $M(hfa)_2$.1,2-DME wherein M is Mg or Zn, hfa is 1,1,1,5,5,5-hexafluoro-2,4-pentanedionate, and 1,2-DME is the neutral 1,2-dimethoxyethane ligand.

4,558,145
PREPARATION OF FE CHELATES

Nelson Smith, Mobile, and Joseph W. Stutts, Jackson, both of Ala., assignors to Ciba Geigy Corporation, Ardsley, N.Y.

Filed Oct. 21, 1983, Ser. No. 544,296
Int. Cl.[4] C07F *15/02*
U.S. Cl. 556—148 8 Claims

1. A process for preparing ferric HO-EDTA which comprises the steps of

(a) adding nitric acid to an aqueous solution of about two thirds of the stoichiometric equivalent of trisodium N-(2-hydroxyethyl)ethylenediaminetriacetic acid based on Fe, reacting therewith to form a solution of pH about 1.0 to 1.4;

(b) adding powdered iron to said solution while maintaining the resulting reaction mixture at below about 70° C. to form a ferrous chelate;

(c) adding an amount of said trisodium N-(2-hydroxyethyl)ethylenediaminetriacetic acid sufficient to complete the stoichiometric requirement therefor;

(d) contacting the resulting ferrous chelate mixture, maintained at temperatures in the range 50°–90° C., with an oxygen source to initiate and complete oxidation of the ferrous chelate to ferric chelate;

(e) adjusting the resulting ferric chelate solution to about pH 5.0–6.0 containing less than about 1% free HO-EDTA, and 5.0 to 5.5 wt. % Fe in ferric chelated form.

4,558,146
PROCESS FOR PREPARING VINYLAMINOSILANES

Bernard Kanner, West Nyack; Jennifer M. Quirk, Bedford Hills; Arthur P. De Monte, Brooklyn, all of N.Y., and Kunj R. Mehta, Parkersburg, W. Va., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Jan. 31, 1985, Ser. No. 697,122
Int. Cl.[4] C07F *7/08, 7/10*
U.S. Cl. 556—410 12 Claims

1. Process for preparing vinylaminosilanes by reacting an aminosilane of the general formula I:

$$HSi(NRR')_x(R'')_{3-x} \quad [I]$$

with an alkyne of the general formula II:

$$R'''C{\equiv}CH \quad [II]$$

wherein R′ and R‴ are the same or different and are each hydrogen, a saturated or unsaturated aliphatic hydrocarbon radical or an aromatic hydrocarbon radical, R and R″ are the same or different and are each a saturated or unsaturated aliphatic hydrocarbon radical or an aromatic hydrocarbon radical and x is an integer from 1 to 3, in the presence of a platinum hydrosilation catalyst at a reaction temperature greater than 180° C. to form a vinylaminosilane of the general formula III:

$$R'''CH{=}CHSi(NRR')_x(R'')_{3-x}$$

wherein R, R′, R″, R‴ and x are as before.

4,558,147
ULTRAVIOLET RADIATION-CURABLE SILICONE RELEASE COMPOSITIONS

Richard P. Eckberg, Saratoga Springs; Richard A. Striker, Troy, and Frank J. Modic, Schenectady, all of N.Y., assignors to General Electric Company, Waterford, N.Y.

Filed Aug. 26, 1983, Ser. No. 527,299
Int. Cl.[4] C07F *7/08*
U.S. Cl. 556—427 3 Claims

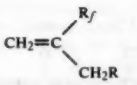
1. An odor-free mercaptoalkoxyalkyl-functional polysiloxane capable of curing to an adhesive polymeric composition on brief exposure to ultraviolet radiation in the presence of an organic compound containing ethylenic unsaturation and a catalytic amount of a photoinitiator consisting essentially of units of the formula RR′SiO, wherein R is hydrogen or $C_{(1-8)}$ alkyl and R′ is hydrogen, $C_{(1-8)}$ alkyl or a monovalent mercaptoalkoxyalkyl-functional organic radical of from 2 to 20 carbon atoms, said diorganopolysiloxane having up to about 50% mercaptoalkoxyalkyl-functional groups and a viscosity of from about 50 to 10,000 centipoise at 25° C.

4,558,148
FLUORINATED ALLYLIC COMPOUNDS AND A PROCESS FOR PREPARING THESE COMPOUNDS

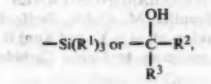
Nobuo Ishikawa, Yokohama, and Tomoya Kitazume, Tokyo, both of Japan, assignors to Daikin Industries Ltd., Osaka, Japan

Filed Jul. 30, 1984, Ser. No. 635,682
Claims priority, application Japan, Jul. 30, 1983, 58-140116; Jul. 30, 1983, 58-140117
Int. Cl.[4] C07F *7/18, 7/08;* C07C *33/46, 33/42*
U.S. Cl. 556—488 13 Claims

1. Fluorinated allylic compounds of the general formula



wherein R_f is a fluorinated aliphatic group, and R is a group of the general formula



wherein R^1 is an aliphatic or aromatic hydrocarbon group and R^2 and R^3 are the same or different groups selected from the group consisting of hydrogen atom, aliphatic and aromatic hydrocarbon groups, and heterocyclic groups.

4,558,149

SULFONATE-CONTAINING PHOTOPOLYMER SYSTEMS

Wayne K. Larson, Maplewood, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 16, 1983, Ser. No. 562,459
Int. Cl.[4] C07C *143/525*
U.S. Cl. 560—14 **11 Claims**

1. A sulfocompound which is the poly(ethylenically-unsaturated ester or amide) of a sulfopolyol or sulfopolyamine comprising the reaction product of:

a. a sulfopolyol or sulfopolyamine which is the reaction product of

(1) one mole of a sulfodicarboxylic acid and

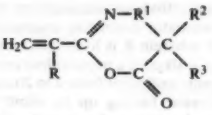
(2) two moles of an aliphatic polyol or polyamine having two or more hydroxyl or amine groups attached to a saturated linear chain of up to about 55 carbon atoms in units of 2 to 12 $—CH_2—$ groups separated by 0 to 22 —O— atoms and 0 to 8

groups, the polyol and polyamine having a molecular weight of less than 1000 and (c+1) hydroxyl or amino groups (in which c is an integer of 1, 2, or 3); and

b. 2 c moles of either (1), (2), or (3), in which

(1) is a compound selected from

(a) 2-alkenylazlactones having the formula



I

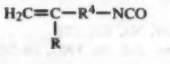
wherein

R is hydrogen or methyl;

R^1 is a covalent bond, $—CH_2—$ or $—CH_2CH_2—$,

R^2 and R^3 are independently hydrogen or methyl; and

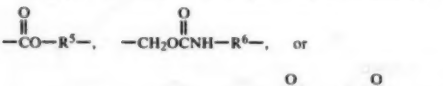
(b) ethylenically-unsaturated isocyanates having the formula



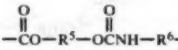
II

wherein

R^4 is a covalent bond, $—CH_2—$,



or



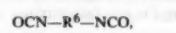
wherein

R^5 is a linear or branched chain of 1 to 12 carbon atoms which can contain one catenary oxygen atom or

group or R^5 is a 5- or 6-membered carbocyclic group which is unsubstituted or substituted by lower alkyl groups having 1 to 4 carbon atoms, the carbocyclic group having a total of up to 12 carbon atoms, and

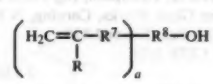
R^6 is an organic group selected from linear or branched alkylene groups having 2 to 12 carbon atoms, a cyclopentamethylene group, a cyclohexamethylene group, a 5- or 6-membered azacyclic group, a phenylene group, a naphthalene group, a phenylenemethylenephenylene group, the organic group being unsubstituted or substituted by up to four lower alkyl groups having 1 to 4 carbon atoms and a total of up to 15 carbon atoms; or

(2) a diisocyanate having the formula



III

the reaction product of said sulfopolyester polyol and said diisocyanate then being reacted with 2 c moles of an ethylenically-unsaturated alcohol having the formula

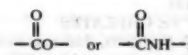


IV

wherein

R and R^6 are as defined above;

R^7 is



R^8 is a polyvalent aliphatic group selected from linear and branched alkyl groups having a valence of (a+1), 2 to 12 carbon atoms which can contain one nonperoxidic catenary oxygen atom or one

group, and alicyclic groups having a 5- or 6-atom carbocyclic structure which is unsubstituted or substituted by up to 4 lower alkyl groups having 1 to 4 carbon atoms and a total of up to 12 carbon atoms; and

a is an integer of 1, 2, or 3; or

(3) the reaction product of one mole of organic diisocyanate of Formula III and one mole of an ethylenically-unsaturated alcohol of Formula IV;

there being essentially no hydroxyl, amino, or isocyanate groups remaining after the reaction of a. with b. (1), b.(2), or b.(3), and the sulfocompound contains a single central sulfo group.

4,558,150
INTERMEDIATES FOR PREPARING AMINO THIOL DIPEPTIDES

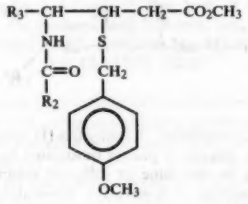
Eric M. Gordon, Pennington, and Jollie D. Godfrey, Jr., Lawrenceville, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 602,030, Apr. 19, 1984. This application Dec. 10, 1984, Ser. No. 680,119

Int. Cl.[4] **C07D** *239/02, 401/00, 213/44, 213/40, 409/00, 211/72, 211/78, 211/70, 209/10, 209/44, 209/04, 333/22, 213/04, 403/00, 233/54, 209/02, 307/02;* **C07C** *103/22*

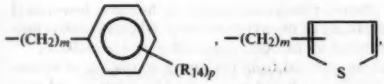
U.S. Cl. 560—16 **6 Claims**

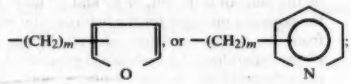
1. A compound of the formula



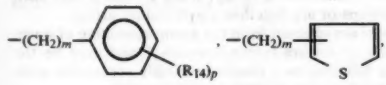
wherein

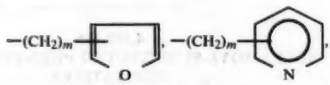
R_2 is



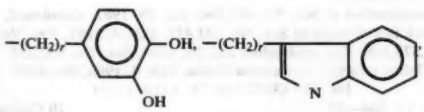


R_3 is hydrogen, lower alkyl,

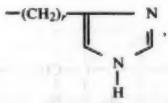




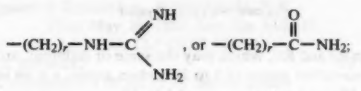
halo substituted lower alkyl, $-(CH_2)_m$-cycloalkyl,



$-(CH_2)_r-OH$,



$-(CH_2)_r-NH_2$, $-(CH_2)_r-SH$, $-(CH_2)_r-S$-lower alkyl,



r is an integer from 1 to 4;

R_{14} is hydrogen, lower alkyl of 1 to 4 carbons, lower alkoxy of 1 to 4 carbons, lower alkylthio of 1 to 4 carbons, chloro, bromo, fluoro, trifluoromethyl, or hydroxy;

m is zero, one, two, three, or four; and

p is one, two or three provided that p is more than one only if R_{14} is hydrogen, methyl, methoxy, chloro, or fluoro.

4,558,151
NEMATIC LIQUID CRYSTALLINE COMPOUNDS

Haruyoshi Takatsu, Kodaira, and Hisato Sato, Tokyo, both of Japan, assignors to Dainippon Ink and Chemicals, Inc., Tokyo, Japan

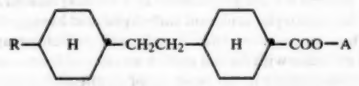
Filed Oct. 28, 1983, Ser. No. 546,511

Claims priority, application Japan, Oct. 30, 1982, 57-191064; Dec. 17, 1982, 57-221196; Dec. 17, 1982, 57-221197; Mar. 18, 1983, 58-44331

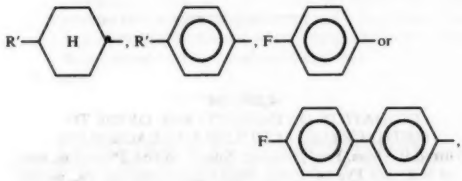
Int. Cl.[4] **C09K** *3/34;* **C07C** *69/753;* **G02F** *1/13*

U.S. Cl. 560—118 **2 Claims**

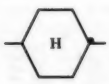
1. A compound represented by the general formula



wherein A denotes



R and R', independently from each other, denote a linear alkyl group having 1 to 9 carbon atoms, and



is a cyclohexane ring arranged in a trans(equatorial-equatorial)form.

4,558,152
FLUOROACRYLIC COMPOUNDS

Shouji Iwatsuki, Aichi, Japan, assignor to Daikin Kogyo Company Limited, Aichi, Japan

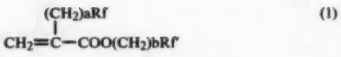
Division of Ser. No. 583,673, Feb. 27, 1984. This application Apr. 24, 1985, Ser. No. 726,667

Claims priority, application Japan, Mar. 7, 1983, 58-37859

Int. Cl.[4] **C07C** *69/653*

U.S. Cl. 560—219 **3 Claims**

1. A compound of the formula



wherein Rf and Rf', which may the same or different, are each a perfluoroalkyl group of 3 to 21 carbon atoms, a is an integer of 2 to 10 and b is an integer of 1 to 10.

4,558,153

PREPARATION OF CARBOXYLIC ACIDS AND ESTERS

John Cook, Hull, England, assignor to BP Chemicals Limited, London, England

Filed Oct. 23, 1984, Ser. No. 663,773

Claims priority, application United Kingdom, Oct. 28, 1983, 8328905

Int. Cl.[4] C07C *67/38, 51/347*

U.S. Cl. 560—247 **18 Claims**

1. A process for the preparation of a carboxylic acid, or an ester of the carboxylic acid, said carboxylic acid having at least two carbon atoms more than formic acid, which comprises reacting an olefin with formic acid or an ester of formic acid at elevated temperature in the presence of an effective amount of a Group VIB metal catalyst and a halide promoter.

18. A process for the preparation of a carboxylic acid or an ester of the carboxylic acid, said carboxylic acid having at least two carbon atoms more than formic acid, which comprises reacting an olefin with formic acid or an ester of formic acid at elevated temperature in the presence of an effective amount of a Group VIB metal carbonyl compound as catalyst.

4,558,154

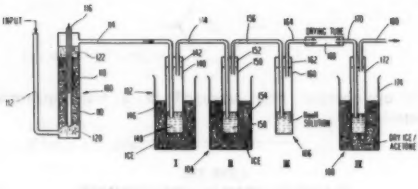
OXIDATION OF ISOBUTYLENE OXIDE TO METHACRYLIC ACID AND METHACROLEIN

Wilfred P. Shum, East Windsor; John F. White, Princeton, both of N.J., and Eva M. Beals, Washington Crossing, Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Apr. 27, 1981, Ser. No. 257,675

Int. Cl.[4] C07C *51/21, 51/23*

U.S. Cl. 562—537 **9 Claims**



1. A method for producing methacrylic acid comprising: contacting a catalyst comprising a member selected from the group consisting of a heteropolyacid, and an oxide of a metal of Group IV A, V A, VI A, VII A, VIII, or I B of the Periodic Table of Elements, thallium, tin, lead, arsenic, antimony, bismuth, phosphorous, cerium, uranium and thorium with an isobutylene oxide vapor in the presence of oxygen to produce a reaction mixture containing said methacrylic acid.

4,558,155

N-(ARYLOXYALKYL)-N'-(AMINOALKYL)THIOUREAS

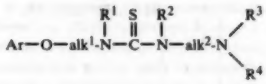
James R. Shanklin, Jr., and Christopher P. Johnson, III, both of Richmond, Va., assignors to A. H. Robins Company, Incorporated, Richmond, Va.

Division of Ser. No. 492,534, May 9, 1983, Pat. No. 4,500,529, which is a continuation-in-part of Ser. No. 265,510, May 20, 1981, abandoned. This application Nov. 13, 1984, Ser. No. 670,795

Int. Cl.[4] C07C *157/09*

U.S. Cl. 564—27 **4 Claims**

1. A N-(Aryloxyalkyl)-N'-(aminoalkyl)thiourea selected from the group of compounds of the formula



wherein

Ar is 1 and 2-naphthyl, 2,3-dihydro-1H-inden-4(or 5)-yl, 3-pyridinyl, phenyl or phenyl substituted by 1–3 radicals which may be the same or different selected from the group consisting of loweralkyl, loweralkoxy, halogen, trifluoromethyl, amino, cyano, aminocarbonyl, nitro, loweralkylthio, loweralkylsulfinyl, loweralkylsulfonyl, loweralkanoyl, benzolyamino or loweralkanoylamino;

R^1 and R^2 are selected from the group consisting of hydrogen, loweralkyl, cycloalkyl containing 3 to 9 carbon atoms, phenyl, phenyl substituted by halogen, loweralkyl or loweralkoxy or phenyl-loweralkyl wherein phenyl may be substituted by halogen, loweralkyl or loweralkoxy;

R^3 and R^4 are selected from the group consisting of hydrogen, loweralkyl, phenyl and phenyl-loweralkyl and may be the same or different, or R^3 and R^4 taken together with the adjacent nitrogen form a heterocyclic residue selected from the group consisting of pyrrolidino, piperidino, 4-phenylpiperidino, 2,6-loweralkyl-piperidino, 4-hydroxy-4-phenylpiperidino, 4-cyano-4-phenylpiperidino, 4-phenyl-1,2,3,6-tetrahydropyridino, piperazino, 4-loweralkyl-piperazino, 4-phenyl-piperazino, 4-phenyl-loweralkyl-piperazino or morpholino radicals; with the proviso that Ar is not unsubstituted phenyl when R^3 and R^4 are each ethyl groups or are together a pyrrolidino group;

alk^1 and alk^2 are selected from the group consisting of loweralkylene or loweralkylene-loweralkyl and may be the same or different, or a pharmaceutically acceptable addition salt or hydrate thereof.

4,558,156

SULFAMOYL-SUBSTITUTED PHENETHYLAMINE DERIVATIVES

Kazuo Imai; Kunihiro Niigata; Takashi Fujikura, all of Saitama; Shinichi Hashimoto, Chiba, and Toichi Takenaka, Tokyo, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

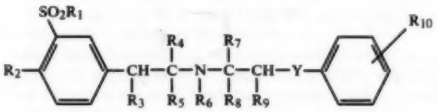
Continuation of Ser. No. 403,006, Jul. 29, 1982, abandoned, which is a division of Ser. No. 231,421, Feb. 4, 1981, Pat. No. 4,373,106. This application Jul. 18, 1984, Ser. No. 632,258

Claims priority, application Japan, Feb. 8, 1980, 55-14383

Int. Cl.[4] C07C *143/78;* **A61K** *31/18*

U.S. Cl. 564—85 **10 Claims**

1. Sulfamoyl-substituted phenethylamine derivatives represented by the general formula



wherein R_1 represents an amino group or a mono- or di-lower alkylamino group; R_2 represents a hydroxyl group, a lower alkyl group, or a lower alkoxy group; R_3 represents a halogen atom, a phenylthio group, or a phenylsulfinyl group; R_4, R_5, R_6, R_7, R_8, and R_9 each represents a hydrogen atom or a lower alkyl group; R_{10} represents hydrogen atom, a lower alkyl group, or a lower alkoxy group; and Y represents an oxygen atom or a methylene group; said Y being, however, an oxygen atom when R_2 is a hydroxyl group and the salts thereof.

4,558,157

SYNTHESIS OF DIMETHYLFORMAMIDE

John A. Marsella, and Guido P. Pez, both of Allentown, Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jun. 5, 1984, Ser. No. 617,305
Int. Cl.[4] C07C *102/00*
U.S. Cl. 564—132 **14 Claims**

1. A process for the synthesis of N-methyl and N,N-dimethyl formamide which comprises reacting carbon monoxide and hydrogen with ammonia or formamide at an elevated temperature in the range of 200°–235° C., a total pressure in the range of 3000–8000 psi and a partial pressure of hydrogen of at least 1500 psi in the presence of a platinum group catalyst and in the further presence of a nonreactive, polar solvent which does not contain an active methyl function and has a dielectric constant greater than 5, as measured at 25° C. or at the melting point of the solvent whichever value is higher.

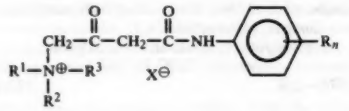
4,558,158

PROCESS FOR THE PRODUCTION OF 4-(TRIALKYLAMMONIUM)-ACETOACETARYLIDES

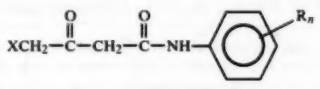
Leander Tenud, and Synèse Jolidon, both of Visp, Switzerland, assignors to Lonza Ltd., Gampel/Valais, Switzerland

Filed Jun. 7, 1983, Ser. No. 501,898
Claims priority, application Switzerland, Jun. 18, 1982, 3769/82
Int. Cl.[4] C07C *91/42*
U.S. Cl. 564—194 **8 Claims**

1. Process for the production of a 4-(trialkylammonium)-acetoacetarylide having the formula:



wherein R is H, a lower alkyl, —OCH_3, —OC_2H_5, —Cl, —Br, —NO_2 and —$NHCOCH_3$; n is 1 to 3; R^1, R^2 and R^3 each is an alkyl having 1 to 18 C atoms; and X is Cl or Br, comprising reacting a 4-haloacetoacetarylide having the formula:



wherein X, R and n have the same definition as above, with a trialkylamine having the formula:

wherein R^1, R^2 and R^3 have the same definition as above, at a low temperature in the presence of an organic solvent.

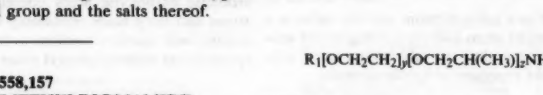
4,558,159

POLYETHER BIGUANIDE SURFACTANTS

David R. McCoy, and Carter G. Naylor, both of Austin, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed May 29, 1984, Ser. No. 614,611
Int. Cl.[4] C07C *129/16*
U.S. Cl. 564—233 **10 Claims**

1. A composition of mater of the formula:



wherein:

y ranges from 0 to 6,

z ranges from 2 to 14,

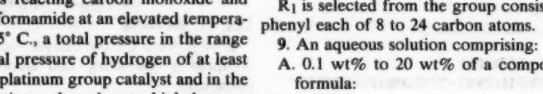
A is an anion selected from the group consisting of chloride, bromide, sulfate, bisulfate, phosphate, dihydrogen phosphate and hydrogen phosphate,

n is the valence of the anion and

R_1 is selected from the group consisting of alkyl and alkylphenyl each of 8 to 24 carbon atoms.

9. An aqueous solution comprising:

A. 0.1 wt% to 20 wt% of a composition of matter of the formula:



wherein:

y ranges from 0 to 6,

z ranges from 2 to 50,

A is an anion selected from the group consisting of chloride, bromide, sulfate, bisulfate, phosphate, dihydrogen phosphate and hydrogen phosphate;

n is the valence of the anion, and

R_1 is selected from the group consisting of alkyl and alkylphenyl each of 1 to 24 carbon atoms with the proviso that when z ranges from 2 to 14, R_1 is limited to 8 to 24 carbon atoms and when z ranges from 15 to 50, R_1 is limited to 1 to 7 carbon atoms; and

B. water.

4,558,160

PRODUCTION OF DICHLOROFORMOXIME

William R. Hydro, 1309 Saratoga Dr., Bel Air, Md. 21014

Filed Apr. 25, 1984, Ser. No. 603,847
Int. Cl.[4] C07C *131/00*
U.S. Cl. 564—261 **13 Claims**

1. A method for the production of dichloroformoxime comprising dissolving chloropicrin in a nonbasic aprotic organic solvent together with anhydrous hydrogen chloride, and reducing said chloropicrin to dichloroformoxime in said solution in the presence of powdered tin.

4,558,161

PROCESS FOR PREPARING HALO-SUBSTITUTED DIARYLSULFONES

Yukichi Morita; Koji Ono; Eiji Ogata, all of Wakayama, and Osamu Manabe, Osaka, all of Japan, assignors to Konishi Chemical Industry Co., Ltd., Wakayama, Japan

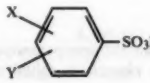
PCT No. PCT/JP83/00155, § 371 Date Jan. 25, 1984, § 102(e) Date Jan. 25, 1984, PCT Pub. No. WO83/04251, PCT Pub. Date Dec. 8, 1983
PCT Filed May 20, 1983, Ser. No. 588,865
Claims priority, application Japan, May 25, 1982, 57-89455
Int. Cl.[4] C07C *147/06*
U.S. Cl. 568—34 **5 Claims**

1. A process for preparing a diarylsulfone, the process comprising reacting chlorosulfonic acid with a mixture of (i) a

halogenated aromatic hydrocarbon represented by the formula

(I)

wherein one of X and Y is a halogen atom and the other is a halogen atom or a hydrogen atom and (ii) a halogenated aromatic sulfonic acid corresponding to said halogenated aromatic hydrocarbon (i) and represented by the formula



(II)

wherein X and Y are identical to X and Y of said halogenated aromatic hydrocarbon (i).

4,558,162

4,4'-BIS(4-HYDROXYPHENYL THIO)BIPHENYLS

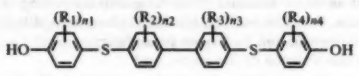
Sivaram Krishnan, Moers, Fed. Rep. of Germany, and John R. Sanderson, Austin, Tex., assignors to Mobay Chemical Corporation, Pittsburgh, Pa.

Division of Ser. No. 383,893, Jun. 1, 1982, Pat. No. 4,463,163. This application May 7, 1984, Ser. No. 607,552

Int. Cl.⁴ C07D *147/06, 147/10*

U.S. Cl. 568—48 **2 Claims**

1. A monomer of the structural formula



wherein

R_1, R_2, R_3 and R_4, which may be the same or different, are C–C_4-alkyl, Cl or Br, and n_1, n_2, n_3 and n_4, which may be the same or different, are 0, 1 or 2.

4,558,163

PROCESS FOR PREPARING 9,10-ANTHRACENEDICARBOXALDEHYDE

Steven L. Peake, Ridgefield, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed Jul. 19, 1984, Ser. No. 632,356

Int. Cl.⁴ C07C *45/33, 47/546*

U.S. Cl. 568—436 **5 Claims**

1. The process of preparing 9,10-anthracenedicarboxaldehyde which comprises oxidizing 9,10-bis(chloromethyl)anthracene with 2-nitropropane in a binary solvent system consisting essentially of dimethylsulfoxide or dimethylformamide and an alkanol (C_1–C_4) in the presence of an alkali metal hydroxide and under an inert atmosphere at a temperature of from about 15° C. to about 85° C. for a period of time sufficient for a substanial degree of oxidation to occur.

4,558,164

PRODUCTION OF DINITRODIPHENYL ETHER

Willard J. Jones, Pitman, N.J., and Thomas P. Gannett, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 6, 1984, Ser. No. 637,802

Int. Cl.⁴ C07C *79/35, 41/01*

U.S. Cl. 568—585 **10 Claims**

1. A process for preparing a symmetrical dinitrodiphenyl ether from o- or p-nitrochlorobenzene or o- or p-nitrofluorobenzene starting material comprising forming a reaction medium wnich is a solution of 10 to 60% by weight o- or p-nitrochlorobenzene or o- or p-nitrofluorobenzene in an aprotic polar organic solvent said solution containing about 0.4 to 0.6 mole, per mole of o- or p-nitrochlorobenzene or o- or p-nitrofluorobenzene, of sodium carbonate or potassium carbonate and from 0.01 to 0.1 mole, per mole of o- or p-nitrochlorobenzene or o- or p-nitrofluorobenzene, of a sodium or potassium salt of carboxylic acid selected from the group comprising aromatic carboxylic acids containing from 7 to 12 carbon atoms and fatty acids containing from 2 to 20 carbon atoms, heating said reaction medium to from 150° to 210° C. to form symmetrical dinitrodiphenyl ether.

4,558,165

CHROMIUM PHOSPHATE CATALYST

Marvin M. Johnson, and Gerhard P. Nowack, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 578,394, Feb. 9, 1984. This application Apr. 19, 1985, Ser. No. 725,052

Int. Cl.⁴ C07C *41/09*

U.S. Cl. 568—698 **7 Claims**

1. A process for the dehydration of an alcohol to an ether comprising contacting said alcohol with a chromium (III) phosphate.

4,558,166

PROCESS FOR THE PREPARATION OF BENZAL CHLORIDES

Bernd Baasner, Leverkusen, and Erich Klauke, Odenthal, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 21, 1984, Ser. No. 591,666

Claims priority, application Fed. Rep. of Germany, Mar. 25, 1983, 3310953

Int. Cl.⁴ C07C *17/00*

U.S. Cl. 570—144 **11 Claims**

1. A process for preparing a benzal chloride which comprises contacting a benzotrichloride with a thiol in the presence of a halide of copper.

4,558,167

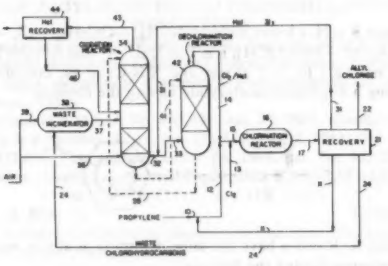
HYDROGEN CHLORIDE-PROPYLENE SEPARATION

Herbert Riegel, Maplewood; Chiung-Yuan Huang, and Vincent A. Strangio, both of Glen Ridge, all of N.J., assignors to The Lummus Company, Bloomfield, N.J.

Filed Aug. 1, 1983, Ser. No. 519,250

Int. Cl.⁴ C07C *21/067*

U.S. Cl. 570—238 **12 Claims**



6. In a process for producing allyl chloride by thermal chlorination of propylene wherein the reaction effluent is comprised of unreacted propylene, hydrogen chloride, allyl chloride and other chlorinated C_3 compounds, the improvement comprising:

extractively distilling said effluent in the presence of an inert

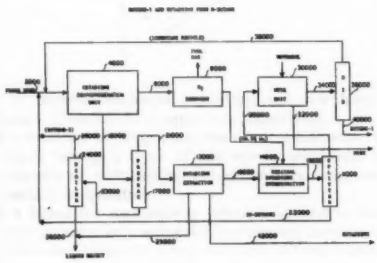
extraction solvent which preferentially absorbs propylene and which boils above hydrogen chloride and propylene to recover hydrogen chloride as light ends and extraction solvent, propylene, allyl chloride and other chlorinated C_3 hydrocarbons as heavy ends.

3,558,168

PRODUCTION OF HIGH PURITY BUTENE-1 FROM AN N-BUTANE FEEDSTOCK

Stanley Gussow, Macungie; David C. Spence, Coopersburg, and William A. Schwartz, Fogelsville, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jun. 19, 1985, Ser. No. 746,605
Int. Cl.[4] C07C *7/01*
U.S. Cl. 585—324 **4 Claims**



4. A process for producing butene-1 from a feedstock containing n-butane and other C_2 to C_6 hydrocarbons which comprises the steps:

(a) dehydrogenating a feedstock containing n-butane in the presence of a chromia-alumina catalyst to produce reaction product containing butene-1, butene-2, butadiene, and unreacted materials;

(b) hydrogenating the butadiene product produced in the dehydrogenation step to produce additional butene-1 and butene-2;

(c) fractionating the reaction product from the butadiene hydrogenation step to produce an overhead stream comprising butene-1, butene-2, and isobutene and a bottoms fraction containing C_5 plus hydrocarbons;

(d) contacting the overhead stream from the fractionation of step (c) with a solvent selective for extracting butene-1 from butene-2 and saturated hydrocarbons;

(e) separating the butene-2 from the saturates by fractionation;

(f) isomerizing the butene-2 from the butene-1 extraction by contact with an isomerization catalyst and recycling the isomerization reaction product to the feed to the deoiler in step (c);

(g) contacting the butene-1 from the extraction in step (d) with methanol to convert the isobutylene to methyl tertiary butyl ether thereby generating a reaction product containing said ether and unreacted butene-1;

(h) fractionating the methyl tertiary butyl ether from the reaction product in step (g) to produce a bottoms comprising methyl tertiary butyl ether and an overhead fraction comprising butene-1; and then

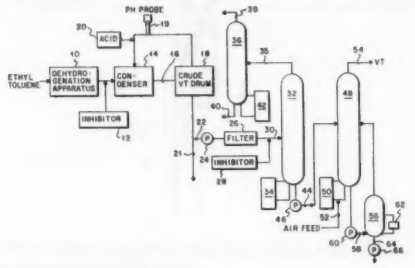
(i) recovering said butene-1 and methyl tertiary butyl ether.

4,558,169

PROCESS FOR THE PRODUCTION OF VINYLTOLUENE

James M. Watson, Big Spring, Tex., and Darrell E. Bailey, Prairieville, La., assignors to Cosden Technology, Inc., Dallas, Tex.

Continuation of Ser. No. 221,662, Dec. 31, 1980, abandoned. This application Nov. 5, 1984, Ser. No. 668,421
Int. Cl.[4] C07C *5/367*
U.S. Cl. 585—440 **13 Claims**



1. A process for the preparation of vinyltoluene, comprising the steps of:

passing ethyltoluene through a dehydrogenation zone to form vaporous crude vinyltoluene;

adding a first portion of polymerization inhibitor to said vaporous crude vinyltoluene immediately prior to the following condensing step;

condensing said vaporous crude vinyltoluene;

measuring the pH of the aqueous phase of said condensed crude vinyltoluene;

selectively injecting a pH control agent into the aqueous phase of said condensed crude vinyltoluene to adjust its pH to a value sufficient to maintain a major amount of said inhibitor in the organic phase of said condensed crude vinyltoluene;

adding a second portion of polymerization inhibitor to said condensed crude vinyltoluene; and

distilling said condensed crude vinyltoluene under distillation conditions to recover pure vinyltoluene.

4,558,170

POLYISOBUTYLENE PROCESS

Frank J. Chen, Piscataway, and Darrell W. Brownawell, Scotch Plains, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 508,441, Jun. 29, 1983, abandoned, which is a continuation-in-part of Ser. No. 407,763, Aug. 13, 1982, abandoned. This application Sep. 20, 1984, Ser. No. 652,205
Int. Cl.[4] C07C *2/18*
U.S. Cl. 585—532 **8 Claims**

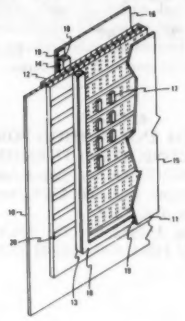
1. A continuous process for preparing low molecular weight polyisobutylene having an M_n in the range of 700 to 3,000 and a molecular weight distribution less than about 2.0 from a feedstream mixture of C_4 hydrocarbons containing at least about 6% by weight isobutylene in a continuous stirred reactor maintained at a reaction temperature of about $-50°$ to $+30°$ C., the reactor having a feedstream inlet and a separate $AlCl_3$ catalyst inlet, which comprises injecting gaseous HCl, in an amount of 25 to 200 ppm parts by weight of feedstream and in the absence of $AlCl_3$, into said feedstream at a point prior to its entry into the reactor in a manner sufficient to permit substantially complete reaction of the HCl with isobutylene to form t-butyl chloride before contact with $AlCl_3$ such that the resulting pre-reacted feedstream at the point of reactor entry contains less than 1.0 ppm HCl, and simultaneously adding the pre-reacted feedstream and the $AlCl_3$ catalyst to the reactor and contacting the pre-reacted feedstream with said catalyst in the reaction mixture to form the polyisobutylene, withdrawing the reaction mixture from the reactor, quenching the reaction with aqueous alkali and separating therefrom the polyisobutylene product.

4,558,171

HERMETIC ENCLOSURE FOR ELECTRONIC COMPONENTS WITH AN OPTIONALLY TRANSPARENT COVER AND A METHOD OF MAKING THE SAME

Francis C. Gantley, Fulton; Jack Chervenic, Liverpool, both of N.Y., and David J. Suconick, Waltham, Mass., assignors to General Electric Company, Syracuse, N.Y.

Filed Oct. 12, 1984, Ser. No. 660,085
Int. Cl.[4] H01L *23/08*
U.S. Cl. 174—52 FP **12 Claims**



1. A hermetic enclosure permitting safe low temperature enclosure of electronic components comprising:

A. a substrate for supporting one or more electronic components having a layer of non-porous insulating material capable of withstanding thick film processing and glass sealing temperatures;

B. a frame for surrounding substrate-supported electronic components, of a non-porous insulating material capable of withstanding the copper-oxygen eutectic temperature, having its under surface sealed to said substrate and a copper layer bonded on its upper surface;

C. a cover for completing the enclosure of said substrate-supported electronic components, of a non-porous insulating material capable of withstanding the copper-oxygen eutectic temperature, and having a copper layer bonded thereto in a configuration matching said layer on said frame; and

D. a solder joint attaching said copper layer on said cover to said copper layer on said frame to permit completion of said enclosure at a low temperature safe for said components.

4,558,172

WALL RECESS CABLE CONNECTOR PERMITTING SIMPLIFIED INNERCONNECTION AND LIMITING PROTRUDING CABLES

Maurice F. Zetena, 31 Lampost Dr., West Redding, Conn. 06876

Filed Aug. 8, 1983, Ser. No. 521,448
Int. Cl.[4] H02G *3/14*
U.S. Cl. 174—66 **3 Claims**

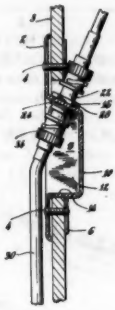
1. A flush-type, connector assembly for interconnecting coaxial cables of office apparatus with pre-wired, interior wall coaxial cables, said assembly including

a wall plate adapted for mounting over an opening in a building wall, and mounting means therefor,

said wall plate including one inwardly-extending recessed chamber having top, bottom, side and back walls, with at least one of said top, bottom, or side walls being at an obtuse angle to the plane of said wall plate,

a coaxial connector mounted on and through said last-named wall, said connector being adapted to interconnect with coaxial cables on each side of said last-named wall,

said obtuse angle being such relative to the dimensions of said chamber and the location of said connector on its said wall as to allow said coaxial cable on the chamber side of said plate to pass out of said recess and lie proximate to and substantially parallel to said building wall,



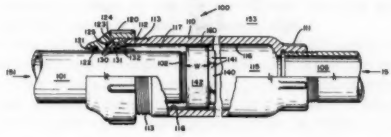
whereby furniture may be placed close to said wall without interference from said cable.

4,558,173

HAZARDOUS LOCATION EXPANSION FITTING

Padej Gajajiva, Fairfield, and Eigil Wium, Cheshire, both of Conn., assignors to General Signal Corporation, Stamford, Conn.

Continuation of Ser. No. 401,589, Jul. 26, 1982. This application Aug. 30, 1982, Ser. No. 412,478
Int. Cl.[4] H02G *15/08*
U.S. Cl. 174—86 **8 Claims**



1. A hazardous location expansion fitting comprising

(a) a metallic body having a first end suitably configured for rigid coupling to a first member by means for preventing the rapid ingress or egress of the external or internal gases, respectively, through said rigid coupling;

(b) a head member coupled to a second end of said metallic body member and suitably configured with a passage therethrough for a liquid tight relationship with a conduit member placed therethrough;

(c) said metallic body member having an interior chamber with a uniform cross section for at least a portion of the length of said body member, said interior chamber having a diameter greater than that of said passage through said head member;

(d) a metallic bushing having a first outer surface configured to mate with said uniform cross section of said interior chamber of said body member and said bushing dividing the interior chamber into two spaced subchambers, said bushing defining with said body member a leakage control through passage from one of the two subchambers to the other subchamber of sufficiently small size and sufficiently great length said through passage being in heat transfer relationship with said body member to cool the gases passing through said leakage control through passage below explosion igniting temperature; and wherein

(e) said bushing includes coupling means for coupling it to an end of said conduit member which enters said body member from said second end thereof and through said passage through said head member whereby the end of said conduit member which is coupled to said bushing is posi-

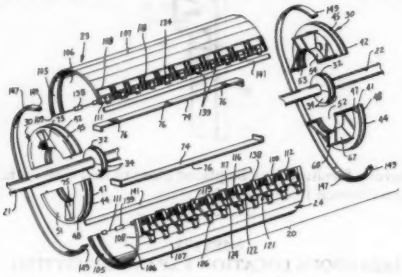
tioned interior of said body member and can reciprocate with respect to said head member and said body member and concomitantly cause said bushing to reciprocate with respect to said body member.

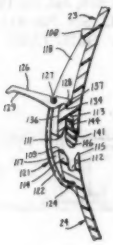
4,558,174

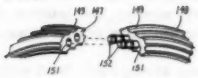
CABLE CLOSURE

John R. Massey, Lawrenceville, Ga., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Apr. 6, 1984, Ser. No. 597,679
Int. Cl.[4] H02G *15/113*
U.S. Cl. 174—92 **14 Claims**







1. A closure adapted to have at least one cable extending thereinto, said closure comprising:

first and second aligned end plates being spaced apart with at least one end plate having at least one opening therein to allow at least one cable to extend into the closure;

first and second covers which are assembled together to enclose peripheries of said end plates and which include adjacent longitudinal edge portions having facing grooves;

a circumferential resilient gasket which has longitudinally extending weakened portions and which is disposed about the periphery of each said end plate between the end plate and said covers;

a longitudinal resilient gasket which is disposed within the facing grooves at each joint between said covers and which spans across adjacent weakened portions of a circumferential gasket, each said longitudinal gasket being disposed in compliant engagement with said weakened portions of said circumferential gasket and with walls which form said grooves at each confluence between said covers and an end plate; and

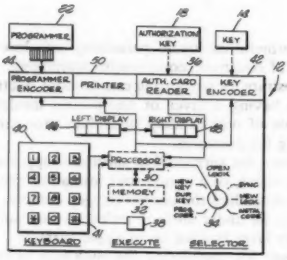
means for causing forces to be applied to said covers to hold said covers secured together and to cause each said longitudinal gasket to become disposed in and to be maintained in compliant engagement with said weakened portions of said circumferential gasket at each confluence of said covers and each end plate, said longitudinal and circumferential gaskets providing seals between said covers and between said covers and said end plates.

4,558,175

SECURITY SYSTEM AND METHOD FOR SECURELY COMMUNICATING THEREIN

Leonard J. Genest, 1061 Tropic La., Santa Ana, Calif. 92705, and J. Francis Calvagna, Anaheim, Calif., assignors to Leonard J. Genest, Santa Ana, Calif.

Filed Aug. 2, 1982, Ser. No. 404,166
Int. Cl.[4] H04L *9/00*; H04Q *3/00*
U.S. Cl. 178—22.08 **18 Claims**



1. A method for securely communicating data to a lock device in a system having a central console, a console coded programmer having a memory and a data word modifying means, and at least one lock, the console having a memory in which is stored at least one combination code for each lock in the system, the method comprising the steps of:

(a) selecting a combination code for a specified lock from the memory of the central console;

(b) generating a first modifier code from the selected combination code according to a first predefined operation set;

(c) generating a programmer data word in the central console, the programmer data word having the first modifier code as a portion thereof;

(d) scrambling the contents of the programmer data word according to a second predefined operation set to obtain a coded data word;

(e) transferring the coded data word from the central console to the console coded programmer and storing the coded data word in the console coded programmer memory;

(f) unscrambling the coded data word in the programmer data word modifying means to recover the programmer data word;

(g) generating a second modifier code in the programmer data word modifying means by altering the first modifier code according to a third predefined operation set to obtain an altered data word in the programmer;

(h) transferring the altered data word from the console coded programmer to the lock; and

(i) generating the combination code in the lock for use therein by operating on the second modifier code accord-

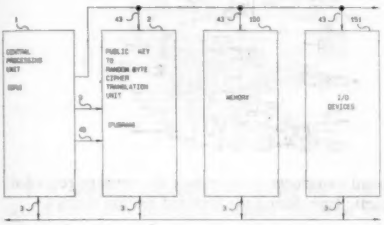
ing to a fourth predefined operation set to obtain the first modifier code and then modifying the first modifier code according to a fifth predefined operation set to obtain the combination code.

4,558,176

COMPUTER SYSTEMS TO INHIBIT UNAUTHORIZED COPYING, UNAUTHORIZED USAGE, AND AUTOMATED CRACKING OF PROTECTED SOFTWARE

Mark G. Arnold, 1400 Grand Ave., Laramie, Wyo. 82070, and Mark D. Winkel, 1518 Gloria, Loveland, Colo. 80537

Filed Sep. 20, 1982, Ser. No. 420,562
Int. Cl.[4] H04K *9/00*
U.S. Cl. 178—22.08 **12 Claims**



1. A general purpose computer system for executing a plurality of encrypted software packages having provisions that inhibit unauthorized usage of encrypted software instructions comprising:

storage means for storing information;

processing means for executing re-encrypted software instructions from the current package using an execution key common to all re-encrypted software instructions, and for executing unencrypted software instructions;

said processing means including register/flag means for storing information being processed by said processing means under the control of said software instructions;

translation means, coupled to said processing means, operative for re-encrypting said plurality of encrypted software packages using said execution key to form a plurality of re-encrypted software packages;

said translation means including multiple translation prevention means for preventing said translation means from storing a second re-encrypted software package into locations of said storage means occupied by a first re-encrypted software package;

secure communication means, coupled to said processing means and said translation means, operative for buffering information between said processing means and said translation means, including information describing the region of said storage means occupied by said plurality of re-encrypted software packages;

said processing means including destruction means for destroying said execution key and the contents of said register/flag means upon receiving a destroy signal;

package description means for indicating the region of said storage means occupied by said current package;

violation recognition means, coupled to said destruction means, operative for generating said destroy signal if a re-encrypted software instruction came from a region of said storage means other than the region of said storage means indicated by said package description means; and

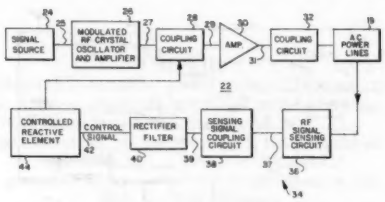
branch allowing means, coupled to said violation recognition means and to said package description means, operative for preventing said violation recognition means from generating said destroy signal when a re-encrypted software instruction executing in said processing means is a handshake instruction originating from a region of said storage means other than the region of said storage means indicated by said package description means, and further for establishing the region of said storage means that contains said handshake instruction as the current package in said package description means, and additionally for erasing a portion of the information contained in said register/flag means.

4,558,177

REGULATED OUTPUT CURRENT SOURCE FOR CORDLESS TELEPHONES

C. James Corris, Shenandoah, and Blaine E. Beck, Peachtree City, both of Ga., assignors to Cellutron Corporation, Stamford, Conn.

Continuation of Ser. No. 538,520, Oct. 3, 1983, abandoned. This application Mar. 7, 1985, Ser. No. 708,381
Int. Cl.[4] H04Q *7/04*
U.S. Cl. 179—2 EA **7 Claims**



1. In a cordless telephone system of the type which includes at least a pair of stations, each including a transmitter and a receiver for exchanging modulated RF signals between the pair of stations and adapted to use an AC power line as a signal-radiating medium, a circuit comprising:

an input source of modulated RF signals comprising an RF carrier signal of a predetermined transmission frequency modulated by a modulating signal for transmitting information in a range of frequencies separate from the transmission frequency of said RF carrier signal;

coupling means for receiving said modulated RF signals and providing a first output signal, said coupling means comprising a tuned transformer in operative circuit with a tuning circuit and tuned to about the frequency of said RF transmission signal, said tuning circuit including a controlled reactive impedance for detuning said transformer in response to a control signal;

output amplifying means coupled to said AC power line for receiving and amplifying said output signal from said coupling means for transmission on said AC power line acting as an antenna;

means for sensing the strength of the RF signal coupled to the AC power line and providing a sensing signal representative of the strength of said RF signal on said AC power line, said control signal being determined from said sensing signal, thereby changing the tuning of the coupling means to control the signal to said output amplifying means and thus to limit the current to said AC power line to a predetermined level;

whereby the effects of impedance variations in AC power lines as a transmission medium for signals of a cordless extension phone are minimized.

4,558,178

WIRELESS TELEPHONE APPARATUS INCLUDING BOTH A TELEPHONE HANDSET AND A TELEPHONE HEADSET

Hiroshi Yasuda, Hino, and Kuniyoshi Marui, Tokorozawa, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jan. 4, 1984, Ser. No. 568,269
Claims priority, application Japan, Jun. 27, 1983, 58-115408
Int. Cl.[4] H04Q *7/04*; H04M *1/00*
U.S. Cl. 179—2 E **9 Claims**

1. In a wireless telephone apparatus capable of sending

outgoing telephone calls and receiving incoming telephone calls, said wireless telephone apparatus including radio signal control means for communicating with a remote base station by transmitting radio signals and acoustic transmission means connected to said radio signal control means for generating and receiving audio signals, said acoustic transmission means comprising:

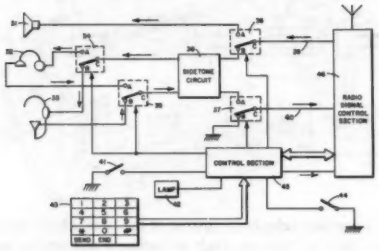
a telephone handset;

a telephone headset;

a ringing device;

transmitting and receiving lines connecting said acoustic transmission means to said radio signal control means;

headset switch means operable by the user of said wireless telephone apparatus for generating a select signal to select said telephone headset;



control means connected to said headset switch means for generating a first control signal to interconnect said telephone headset when said headset switch means generates a select signal and a second control signal to interconnect said telephone handset when no select signal is generated;

first switching means responsive to the first control signal for connecting said telephone headset to said transmitting and receiving lines and responsive to the second control signal for connecting said telephone handset to said transmitting and receiving lines; and

second switching means for connecting said ringing device to said receiving line;

said second switching means being responsive to said control means to actuate said second switching means when said wireless telephone apparatus is in either a standby condition or receiving an unanswered call.

4,558,179

MESSAGE PLAYBACK CONTROL SYSTEM FOR TELEPHONE ANSWERING MACHINE

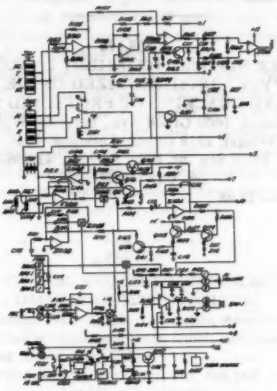
Raymond G. Bond, Long Beach, Calif., assignor to T.A.D. Avanti, Inc., Compton, Calif.

Filed Aug. 31, 1983, Ser. No. 527,978

Int. Cl.[4] H04M *1/64;* G11B *15/00*

U.S. Cl. 179—6.03 **5 Claims**

1. In a telephone answering system which responds to telephone messages received over a telephone line and which includes a magnetic tape mechanism for recording messages received over the telephone line on a magnetic tape, the combination of: a microcomputer; manually operated local switch means connected to the microcomputer; circuit means connecting the microcomputer to the magnetic tape mechanism to cause the magnetic tape mechanism to rewind the magnetic tape in a reverse direction to a predetermined origin position when the switch means is manually operated; further circuit means connecting the microcomputer to the magnetic tape mechanism to cause the manetic tape mechanism to move the magnetic tape in the forward direction after it has reached said predetermined origin position; control circuitry connected to the microcomputer for enabling the microcomputer to stop the forward motion of the magnetic tape mechanism after it has returned to the position at which the switch means was manually operated; a sound transducer; and circuit means connecting the magnetic tape mechanism to the sound transducer to



cause the sound transducer to reproduce the message recorded on the magnetic tape during the forward motion thereof.

4,558,180

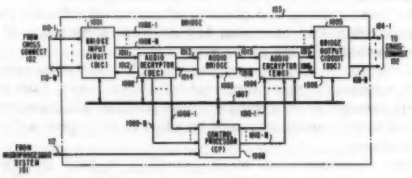
PROGRAMMABLE AUDIO MIXER

Dominick Scordo, Middletown, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Oct. 25, 1983, Ser. No. 545,162

Int. Cl.[4] H04M *3/56;* H04Q *11/04*

U.S. Cl. 179—18 BC **15 Claims**



1. Apparatus for generating mixed audio signals to be transmitted to a plurality of remote locations in a conference, wherein the remote locations include conference locations served by this apparatus and may include other apparatus for generating mixed audio signals to be transmitted to a plurality of remote locations, the apparatus comprising,

means for storing information indicating whether individual ones of incoming transmission paths to this apparatus and outgoing transmission paths from this apparatus are being used in the conference,

means for storing information indicating whether individual ones of the incoming transmission paths and the outgoing transmission paths are assigned to a conference location or to another apparatus for generating mixed audio signals, and

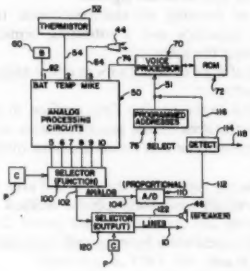
means responsive to said information for generating an appropriate audio mix for each conference location served by this apparatus and a partial sum of audio information from all the conference locations served by this apparatus to be transmitted to said other apparatus in the conference.

4,558,181

PORTABLE DEVICE FOR MONITORING LOCAL AREA

Kenneth E. Blanchard, Springfield, and Stephen V. Sanislo, Jr., Drexel Hill, both of Pa., assignors to Phonetics, Inc., Media, Pa.

Filed Apr. 27, 1983, Ser. No. 488,999
Int. Cl.[4] H04M *11/04*
U.S. Cl. 179—5 P 18 Claims



1. A portable, self-contained device for monitoring a selected local area, having a standard telephone terminal with standard external telephone lines for occurrence of any one of a plurality of preselected conditions adjacent said local area, said device comprising:

(a) means for setting in said device a first identification number corresponding to a telephone number for the external lines into said selected local area;

(b) means for selectively connecting said device onto said standard external telephone lines installed at said selected local area;

(c) means for creating in said device a distinct signal upon occurrence of one of said plurality of preselected conditions;

(d) means for generating in said device a first synthesized voice message in response to said distinct signal;

(e) means for amplifying and playing said first synthesized voice message at local area upon its creation;

(f) means for creating a first telephone format dialing signal corresponding to a second identification number of a first, remote preselected telephone on said lines in response to said distinct signal;

(g) cycling means for repeatedly creating said first dialing signal on said lines at a time interval including at least one pause period during which said device releases said lines for a call back signal indicative of an incoming call to said first indentification number;

(h) means for creating an answer signal upon recognizing the occurrence of an answer at said first remote telephone;

(i) means for creating a second synthesized voice signal in response to an answer signal wherein said second synthesized voice signal includes a representation of said first identification number;

(j) switch means for directing said second synthesized voice signal as intelligence to said lines;

(k) first termination means for terminating operation of said dialing signal creating means in response to a call on said lines only during said at least one pause; and,

(l) means for connecting a standard telephone set to said external lines through said device.

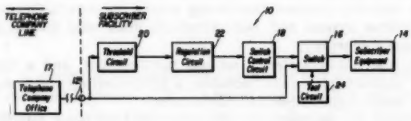
18. A system for detecting the existence of a sound beyond a given level for a preselected period of time, and for alerting an external location of this detection, said system comprising a portable device with means for releasably connecting said device to existing telephone lines, a microphone for detecting sound within a local area, means for creating an alarm signal when the output of said microphone exceeds a preselected level for said preselected period of time, dialing means on said device for automatically dialing a series of telephone numbers by said device in response to said alarm signal, applying said numbers indicative of selected remote telephone locations onto said telephone lines, a sound synthesizer means on said device for applying a voice alarm message on said lines upon an answer from said dialed numbers indicative of the detection of sound beyond a given level, and means for terminating said dialing upon receipt of a call on said lines from one of said selected remote locations.

4,558,182

REMOTELY-ACTIVATED SWITCHING APPARATUS

Steven B. Perry, Highlands, and Joseph Miller, Oakhurst, both of N.J., assignors to Keptel, Inc., Ocean, N.J.

Continuation of Ser. No. 519,410, Aug. 1, 1983, abandoned. This application Nov. 1, 1984, Ser. No. 667,423
The portion of the term of this patent subsequent to Aug. 20, 2002, has been disclaimed.
Int. Cl.[4] H04B *3/46*
U.S. Cl. 179—81 R 5 Claims



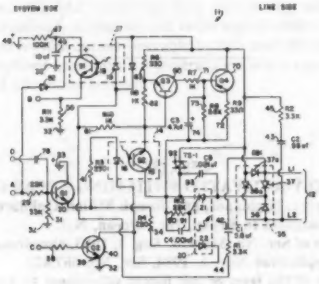
1. A switching device adapted to be coupled to a line such as a telephone line and the like to connect or disconnect equipment connected to the line in response to a signal transmitted on the line from a location remote from the location at which the device is located, the device comprising a relay coupled to the line and to the equipment so as to connect and disconnect the line and the equipment in respective switching states of the relay, the relay having a coil which controls switching of the relay, voltage threshold means having an input coupled to receive voltage from the line and having an output for providing a voltage when the magnitude of the voltage at said input exceeds a threshold voltage magnitude and substantially no voltage when the magnitude of the voltage at said input is less than the threshold voltage magnitude, said voltage at the output of the threshold means being equal to or greater than a predetermined magnitude, voltage regulator means having an input coupled to the output of the voltage threshold means and an output providing a predetermined substantially constant voltage when said voltage magnitude is present at the output of the threshold means, a capacitor coupled to the output of the voltage regulator means adapted to charge when there is a voltage present at the output of the voltage regulator means, discharge means coupled to the capacitor including a diode coupled between the capacitor and the voltage regulator means, the discharge means enabling the capacitor to charge when the voltage at the capacitor is less than the voltage at the output of the regulator means and for discharging the capacitor through the relay coil in a predetermined time period when the magnitude of the voltage at the capacitor exceeds the magnitude of the voltage at the output of the regulator means, the relay coil being coupled to the discharge means and causing the relay to to be in one of the two states when the capacitor is discharging through the discharge means and in the other of the two states when the capacitor is not discharging through the discharge means.

4,558,183

OPTO-COUPLER INTERFACING CIRCUIT

C. James Corris, Shenandoah, and Blaine E. Beck, Peachtree City, both of Ga., assignors to Cellutron Corporation, Stamford, Conn.

Filed Oct. 3, 1983, Ser. No. 538,422
Int. Cl.⁴ H04M *3/22*
U.S. Cl. 179—84 A **20 Claims**



1. In a system of the type which comprises telephone transmission lines and a telephone system adapted to be connected to the telephone transmission lines, the improvement comprising optically-coupled interfacing means for interfacing said telephone system and said telephone lines, said interfacing means comprising:

a first opto-coupler, a second opto-coupler, and a third opto-coupler, each including a light-emitting component and a light-responsive component;

means for establishing a telephone line loop upon detecting a ringing signal on said telephone lines, said telephone line loop establishing means actuating said light-emitting component of said third opto-coupler to connect said telephone lines to said telephone line loop and for actuating the light-emitting component of said first opto-coupler to provide a constant reference signal for said loop;

means in said telephone system for providing an audio signal to said interfacing means for applying said audio signal through said interfacing means to said telephone lines when said telephone loop is established; and

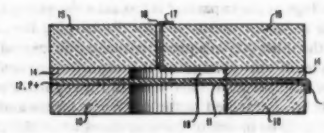
means responsive to the current in said telephone loop when established for actuating the light-emitting component in said second opto-coupler so that said audio signals applied to said interfacing means are outputted from said interfacing means.

4,558,184

INTEGRATED CAPACITIVE TRANSDUCER

Ilene J. Busch-Vishniac, Austin, Tex., and W. Stewart Lindenberger, Somerset, N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation-in-part of Ser. No. 469,410, Feb. 24, 1983, abandoned. This application Jan. 20, 1984, Ser. No. 572,683
Int. Cl.⁴ H04R *23/02*
U.S. Cl. 179—111 R **18 Claims**



1. An electroacoustic transducer comprising

a membrane comprising a thinned portion of a thicker semiconductor substrate, said membrane having a thickness of less than 2.5 μm and an area such that the membrane is adapted to vibrate at a frequency of at least 0.02 kHz; and

a pair of electrodes formed in a spaced relationship so as to constitute a capacitor, where one of said electrodes is formed to vibrate with said membrane such that the electric field between the electrodes varies in relationship with the vibrating membrane to permit conversion between electrical and acoustic signals.

15. A method of forming an electroacoustic transducer which includes a capacitor and a vibrating semiconductor membrane comprising the steps of:

forming a region of high conductivity in a first major surface of the semiconductor;

forming a spacing layer on the first surface in a pattern which exposes the area of the semiconductor which will comprise the membrane and forms a cavity over the said area;

forming an insulating layer over the exposed area to fill the cavity and form an essentially planar surface with the spacing layer;

depositing an electrode over portions of the spacing layer and insulating layer;

depositing a cover layer over the electrode, spacing layer and insulating layer, and forming an opening through said cover layer to the insulating layer;

removing said insulating layer from the cavity to form an air gap between the electrode and the semiconductor surface;

forming a masking layer on the opposite major surface of the semiconductor in a pattern which exposes the area which will comprise the membrane; and

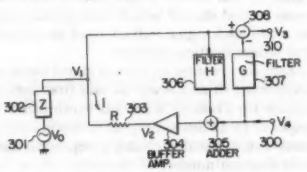
etching the semiconductor area exposed by the mask and stopping at the region of high conductivity to form the membrane.

4,558,185

SUBSCRIBER LINE INTERFACE CIRCUIT WITH COMPLEX IMPEDANCE

Yuichi Morikawa, Zushi; Kazuo Saito, Yokohama; Eiichi Amada, Kokubunji, and Hirotoshi Shirasu, Yokohama, all of Japan, assignors to Nippon Telegraph & Telephone Public Corp. and Hitachi, Ltd., both of Tokyo, Japan

Filed Dec. 1, 1982, Ser. No. 445,976
Claims priority, application Japan, Dec. 2, 1981, 56-192952
Int. Cl.⁴ H04B *1/58*
U.S. Cl. 179—170 NC **8 Claims**



7. A subscriber line interface circuit comprising:

a buffer amplifier for transmitting a signal fed from a four-wire input line to a two-wire subscriber line:

a terminating impedance including a resistor inserted between said buffer amplifier and said two-wire subscriber line;

a filter circuit having an input connected to said four-wire input line;

a subtractor for subtracting the output signal of said filter circuit from a signal on said two-wire subscriber line to feed the resultant difference signal to a four-wire output line; and

a feedback circuit having an input connected to said two-wire subscriber line and said subtractor, an output connected to the input of said buffer amplifier, and having

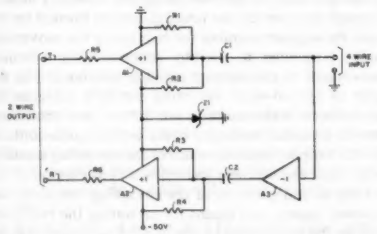
such transfer characteristics that the impedance of the four-wire input line seen from said two-wire subscriber line is a complex impedance, wherein said feedback circuit and said filter circuit comprise switched capacitors and operational amplifiers.

4,558,186

SINGLE POWER SUPPLY BATTERY FEED CIRCUIT

Douglas C. Stahl, Downers Grove, Ill., assignor to GTE Automatic Electric Incorporated, Northlake, Ill.

Filed Sep. 6, 1983, Ser. No. 529,414
Int. Cl.[4] H04B *3/03*; H04M *19/00*
U.S. Cl. 179—170 NC **6 Claims**



1. A circuit for use in a transformerless hybrid arrangement for coupling an input terminal pair to a two wire communication path having first and second terminal said circuit including;

a DC battery voltage source including a positive terminal and a negative terminal and,

a direct current battery feed arrangement for said two wire communication path comprising:

a first low current amplifier including a signal input and a signal output termination and including a positive and a negative current supply terminal,

a second relatively higher current level amplifier including a signal input and a signal output termination and including a positive and a negative current supply terminal,

first means connecting said first amplifier positive current supply terminal to the positive terminal of said DC battery voltage source,

second means connecting said second amplifier negative current supply terminal to the negative terminal of said DC battery source,

a voltage regulator, and means connecting said first amplifier negative current supply terminal to said second amplifier positive supply terminal to complete a series path to conduct a series current across said voltage source terminals,

said voltage regulator connected across said first amplifier negative and positive current supply terminals to thereby shunt a portion of said series current flow from said first amplifier and maintain a constant voltage across said first amplifier current supply terminals,

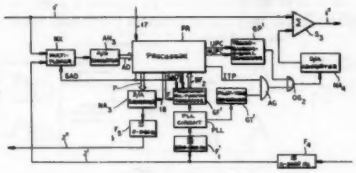
said second amplifier operated to conduct said series current of said series path unshunted by a regulator.

4,558,187

DIGITAL ECHO-CANCELLATION METHOD AND CIRCUIT ARRANGEMENT

Roberto Billi, Leghorn, and Maurizio Copperi, Turin, both of Italy, assignors to CSELT - Centro Studi e Laboratori Telecomunicazioni S.p.A., Turin, Italy

Continuation-in-part of Ser. No. 70,032, Aug. 27, 1979, abandoned. This application Nov. 6, 1981, Ser. No. 319,086
Claims priority, application Italy, Aug. 29, 1978, 68993 A/78
Int. Cl.[4] H04B *3/24*
U.S. Cl. 179—170.2 **6 Claims**



1. A circuit arrangement for eliminating transmitted echoes of received speech signals in a telephone trunk line extending between a remote trunk terminal and a hybrid coil coupling said trunk line to a local line, said trunk line having a first branch carrying received speech signals from said terminal to said hybrid coil and a second branch carrying transmitted speech signals from said hybrid coil to said terminal, said echoes being due to an imperfect match between said hybrid coil and said lines and being affected by a phase roll between said branches, comprising:

calibration means operatively linked to said branches for determining a frequency offset due to the phase roll between a received signal arriving over said first branch and a corresponding transmitted signal carried by said second branch;

a read-only memory in said calibration means for generating digital samples of sine and cosine functions of said frequency offset in response to a signal representing a value of frequency offset;

analog/digital conversion means linked to said branches for generating digital samples of analog voice-frequency signals carried by said branches;

a pseudorandom-sequence emitter operatively connected at an output to said first branch;

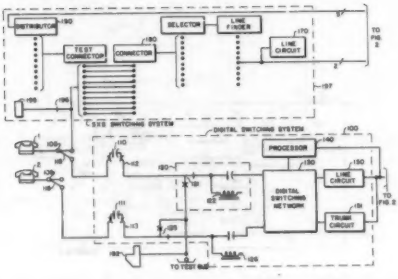
signal-processing means connected to said conversion means and to said memory for utilizing digital signal samples therefrom to compensate phase roll of voice-frequency signals arriving on said second branch for computing convolution coefficients from test signals generated by said emitter and from returning echoes of said test signals, to compensate phase roll on signals present on said second branch due to voice-frequency signals arriving on said first branch, and for differentially combining calculated echo estimates with corresponding phase-roll-compensated signals to produce digital samples of voice-frequency signals purged of echo effects; and

digital/analog conversion means connected to an output of said signal-processing means for transforming echo-purged signals from digital form to analog form.

4,558,188
ARRANGEMENT FOR LINE JUMPER TESTING

Jeffrey J. Stuparits, 5095 Pine Ridge, and Russell L. Cramer, 5056 Lake Harbor Rd., both of Muskegon, Mich. 49441

Filed Dec. 21, 1983, Ser. No. 563,738
Int. Cl.[4] H04M 3/30
U.S. Cl. 179—175.2 D 6 Claims



1. In a pre-cutover switching configuration, an arrangement for single line testing comprising:

at least first and second switching system subscribers;

a first switching system connected to said first and second switching system subscribers, said first switching system being operated to connect said first and second subscribers to any switching system subscribers;

a second switching system connected to said first and second switching system subscribers, said second switching system being in an untested condition, said second switching system comprising:

a switching network connected to said first and second subscribers;

capacitor means for direct current isolating said first and said second subscribers from said second switching system;

means for switching connected between said switching network and said capacitor means, said means for switching being operated to connect said first subscriber to a test interface bus, said means for switching being normally operated to maintain said connection of said first subscriber to said switching network; and

processor means connected to said switching network;

said arrangement for single line testing further comprising:

tone detection means connected to said test interface bus and tone generating means;

means for testing connected to said first switching system and to said switching network of said second switching system, said means for testing being operated to request connection of said tone generating means to said first switching system subscriber via said first switching system;

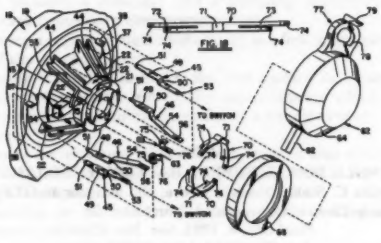
said processor means being responsive to said means for testing to operate said means for switching for connecting said first subscriber to said test interface bus; and

said tone detection means being operated to signal a correct connection of said first subscriber to said test means upon detecting a tone on said test interface bus.

4,558,189
REVERSING SWITCH

John E. Dibbern, Jr., Street, and Gregory E. Moores, Reisterstown, both of Md., assignors to Black & Decker Inc., Newark, Del.

Division of Ser. No. 480,781, Mar. 31, 1983, Pat. No. 4,523,116.
This application Jul. 31, 1984, Ser. No. 636,161
Int. Cl.[4] H01H 9/00, 21/62
U.S. Cl. 200—1 V 13 Claims

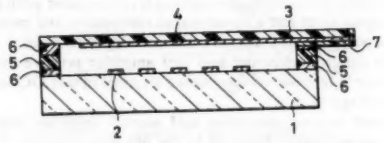


1. A reversing switch for an electrical device having a housing, comprising: a support member, means for rotatably mounting the support member on the housing, means formed on the housing and the support member for restricting the movement of the support member to thereby accommodate a limited pivotal movement of the support member relative to the device, a pair of spaced-apart reversing contacts wherein the major flat surfaces of the contacts are formed in a prescribed arc to provide a natural resiliency in the contacts, the contacts carried by the support member, each of the reversing contacts having bifurcated end sections formed in a continuation of the prescribed arc in end portions of the reversing contacts, two pairs of contact means, and means for mounting the two pairs of contacts on the device and in position for selective engagement, alternately, with the bifurcated sections of the respective end portions of the reversing contacts.

4,558,190
INPUT ELEMENT

Tetsuro Saito, Hiratsuka, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 29, 1984, Ser. No. 594,867
Claims priority, application Japan, Mar. 31, 1983, 58-56221
Int. Cl.[4] H01H 9/00
U.S. Cl. 200—5 A 3 Claims



1. An input element comprising:

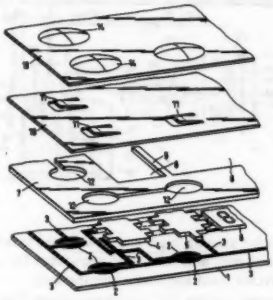
(a) a pair of substrates each having an electroconductive film disposed at a distance to form a space therebetween, the electroconductive film facing each other; and

(b) a spacer disposed between said substrates to surround the space, the electroconductive film of at least one of said substrates extending outside of the spacer, which is adhered by an elastic resin formed by curing an electroconductive adhesive disposed at the crossing portion of the spacer and the electroconductive film extended beyond said crossing portion of the spacer.

4,558,191
BUTTON SWITCH DEVICE

Heinz Burgeth, Gräfenberg; Georg Leitner, and Joachim Wolf, both of Nuremberg, all of Fed. Rep. of Germany, assignors to Telefunken Electronic GmbH, Heilbronn, Fed. Rep. of Germany

Filed Feb. 17, 1984, Ser. No. 581,055
Claims priority, application Fed. Rep. of Germany, Feb. 18, 1983, 3305619
Int. Cl.⁴ H01H *3/12*
U.S. Cl. 200—5 A **22 Claims**

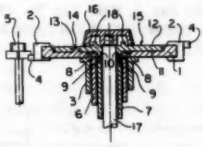


1. A button switch device, comprising:
a base;
a conductor pattern on said base, said conductor pattern including pairs of spaced-apart switch contact surfaces;
film circuit components on said base and distributed among said pairs of switch contact surfaces, said circuit components being electrically connected to said conductor pattern;
a spacer plate on top of said base, said spacer plate having recesses at respective pairs of switch contact surfaces and having recesses at respective circuit components to accommodate said components, said spacer plate having a thickness greater than that of said circuit components; and
switch closure means spaced apart from said pairs of contact surfaces and manually moveable toward respective pairs of contact surfaces for selectively connecting the contact surfaces of respective pairs.

4,558,192
MULTI-RANGE TIMER SWITCH DEVICE

Friedrich X. Thoma, Haslach, Fed. Rep. of Germany, assignor to Dieter Graesslin Feinwerktechnik, Fed. Rep. of Germany

Filed Dec. 23, 1982, Ser. No. 452,727
Int. Cl.⁴ H01H *7/08*
U.S. Cl. 200—35 R **27 Claims**

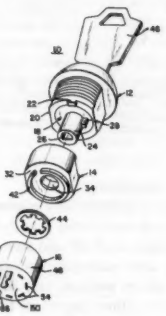


1. A multi-range switch device for use with a drive means for actuating a stationary switch means according to a temporal program comprising:
a rotatable switching element carrying a plurality of programmable switch riders for actuating said stationary switch means;
at least two time scales having different time divisions;
at least two drive elements connectable to said drive means for respectively rotating said switching element at different speeds corresponding to said different time scale divisions; and
a disengageable coupling means for alternatively connecting said switching element to one of said drive elements and arranged with respect to said time scales for simultaneously exposing the time scale associated with the connected drive element such that said time scale corresponding to said connected drive element can assume only one radial position with respect to said switching element, said one radial position corresponding to a same position for the other time scale before disengagement,
whereby said time scale corresponding to said connected drive element is automatically and simultaneously exposed and temporally set upon a change of the connection of said switching element from one drive element to another drive element.

4,558,193
SWITCH LOCK

Dan Test, Winchester, Mass., assignor to C & K Components, Inc., Newton, Mass.

Continuation of Ser. No. 480,893, Mar. 31, 1983, abandoned.
This application Jul. 27, 1984, Ser. No. 634,192
Int. Cl.⁴ H01H *9/28*
U.S. Cl. 200—43.05 **7 Claims**

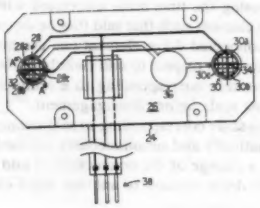


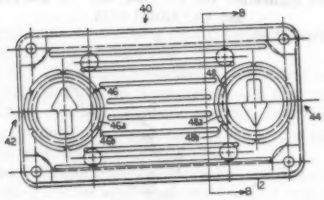
1. A lock actuated switch device comprising a key, a lock, a top plate and a switch, the lock having a shell the lock also having a key hole and an activating means, the activating means extending from the lock through the shell, having a first free end and having a longitudinal axis, the shell having a stud extending therefrom and a projection extending from the activating means in angular relation to the longitudinal axis, the key engageable in the key hole and adapted on movement to rotate the activating means, the top plate having an upper surface, a lower surface and a central through aperture, the upper surface having a notch and a recess formed therewith, the recess having at least one stop position, the activating means extending through the aperture in the top plate with the lock bearing against the upper surface of the top plate and at least a portion of the projection seated in the recess and the stud seated in the notch, the switch having an actuating means and the activating means engaging the actuating means whereby rotation of the key will actuate the switch.

4,558,194
FOOT PEDAL SWITCH

Wayne T. Wiblin, Ashtabula, Ohio, assignor to Towmotor Corporation, Mentor, Ohio

Filed Mar. 21, 1984, Ser. No. 591,742
Int. Cl.[4] H01H 3/14
U.S. Cl. 200—61.89 9 Claims





1. A pedal, comprising:

a base having a substantially planar surface,

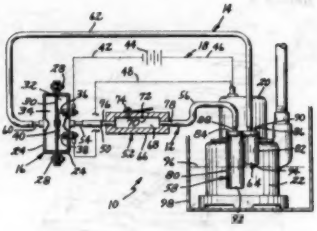
first and second switchable members connected to said base planar surface, each of said switchable members having a respective axis extending substantially perpendicular to said base planar surface, said first and second switchable members including respective first and second membrane switches, each of said first and second membrane switches having first and second spaced apart electrically conductive contact surfaces, at least one of said first and second electrically conductive contact surfaces being attached to a flexible polymer film and maintained separated from the other of said first and second electrically conductive contact surfaces by a pressure medium contained within an enclosed pressurable chamber, said flexible polymer film forming one wall of said enclosed pressurable chamber, said respective pressurable chambers being connected each to the other and to a common pressure medium reservoir by respective passageways; and

a pad having first and second integral movable members, each of said movable members having a respective contact surface, said pad being connected to said base, said movable member contact surfaces lying in a plane substantially parallel to said base planar surface, each of said movable member contact surfaces being aligned with and adjacent a respective one of said first and second switchable members along the associated respective axis, said pad and said movable members being of unitary construction.

4,558,195
APPARATUS AND METHOD FOR SENSING HIGH AND LOW LIQUID LEVEL TO CONTROL A CIRCUIT

Charles W. Steiner, Brooklyn Park, and René D. Sovia, Forest Lake, both of Minn., assignors to The Marley-Wylain Company, Mission Woods, Kans.

Filed Dec. 23, 1983, Ser. No. 565,202
Int. Cl.[4] H01H 35/40
U.S. Cl. 200—83 R 6 Claims



1. Apparatus for sensing high and low liquid level in a reservoir where liquid rises and falls, said apparatus for controlling an electrical circuit, said apparatus comprising:

first and second means for communicating fluid between first and second ends, the first ends being open and located in said reservoir, the first end of said first communicating means being elevationally lower than the first end of said second communicating means, said first communicating means including a check valve between the first and second ends, said check valve relieving over-ambient pressure to ambient; and

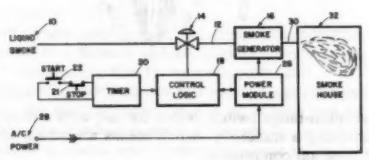
switch means for sensing a higher fluid pressure in said second communicating means than in said first communicating means, the second ends of said first and second communicating means being connected to said switch means, said check valve and said switch means being located above the liquid level, said switch means closing said circuit when said higher pressure is sensed;

whereby as liquid rises in said reservoir to enter the first ends of both said first and second communicating means, pressure in said first communicating means is relieved to ambient through said check valve while higher fluid pressure in said second communicating means creates a differential pressure across said switch means to function said switch means from a first state to a second state, said switch means functioning from said second state back to said first state when liquid falls beneath the first end of said first communicating means.

4,558,196
INDUCTION SMOKE REGENERATOR AND METHOD FOR PRODUCING NATURAL SMOKE

Wolfgang Babasade, 405 Knierim Pl., New Milford, N.J. 07646

Filed Jan. 5, 1983, Ser. No. 455,891
Int. Cl.[4] H05B 5/00; A23B 1/30; A01J 11/00
U.S. Cl. 219—10.51 8 Claims



1. An apparatus for generating smoke in a gaseous state comprising:

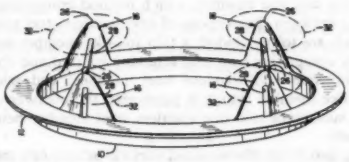
a source of liquid smoke;
means for mixing the liquid smoke with water in a predetermined ratio;
a stationary, non-rotatable, heatable hollow member;
inductive heating means including inductive coil means disposed around said heatable hollow member; and
means for injecting the water/liquid smoke mixture into the interior of said heatable hollow member,
said heatable hollow member raised to a sufficiently high temperature by said inductive heating means,
whereby said injected water/liquid smoke mixture is vaporized into a gaseous smoke state when it contacts the wall of said heatable hollow member.

4,558,197

POTATO COOKER FOR MICROWAVE OVENS

Tim A. Wyatt, Portland, Oreg., assignor to Leem Company, Inc., Portland, Oreg.

Filed Feb. 29, 1984, Ser. No. 584,794
Int. Cl.[4] H05B *6/80*
U.S. Cl. 219—10.55 E **17 Claims**



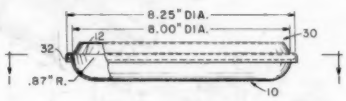
1. A baking device especially for baking potatoes in a microwave oven, comprising:
a self-supporting base,
an upstanding blade projecting upwardly from said base,
said blade having broad opposing surfaces and a thin dimension between said surfaces, said broad surfaces terminating at relatively thin free edges that converge to define a blunt apex of the blade,
said blade including a moisture ventilation depression extending continuously in a vertical direction below the level of normal potato penetration in at least one surface of said blade for venting moisture from the potato.
said base and blade being substantially transparent to microwave radiation.

4,558,198

METAL CONTAINER SYSTEM FOR USE IN MICROWAVE OVENS

Thomas L. Levendusky, Greensburg, and Arthur Benson, Plum Borough, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Dec. 3, 1984, Ser. No. 677,590
Int. Cl.[4] H05B *6/80*
U.S. Cl. 219—10.55 E **7 Claims**



1. In combination, a metal container for use in microwave and convection ovens, wherein the microwave oven is supplied with microwave energy by a magnetron, the container having:
substantially smooth wrinkle-free side and bottom walls and edges,
with the side wall in elevation being provided with a curved configuration of substantial radius,
the configuration of the receptacle in plan view being either round or having rounded corners with substantial radii,
the substantial radii of the side wall and corners preventing or at least substantially redcuing the concentration of electromagnetic energy in a microwave environment,
with the height of the container being 33 millimeters or less,
the surfaces of said walls and edges being coated on both sides with a layer of heat-resistant, electrically insulating plastic material of a thickness on the order of 0.25 to 2.5 mils, said plastic material being effective to diffuse and thereby prevent substantial reflection of microwave energy toward the magnetron of the microwave oven, and
a heat-resistant, electricaly insulating plastic rigid microwave transparent lid for said container, said lid having edge portions that extend over and beside the edges of the container when the lid is placed thereon, and thus insulate said edges elextrically from the walls of an oven.

4,558,199

Patent Not Issued For This Number

4,558,200

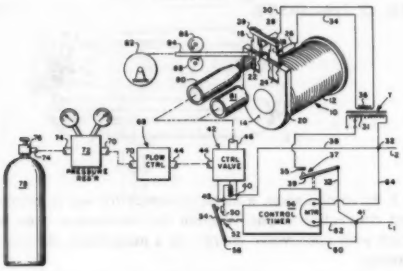
ELECTRICAL LEAD TERMINATION

Charles H. Weigand, Jr., Savanna, Ill., assignor to Eaton Corporation, Cleveland, Ohio

Filed Aug. 12, 1983, Ser. No. 522,444
Int. Cl.[4] B23K *1/12*
U.S. Cl. 219—85 CM **6 Claims**

1. A method of making circuit terminations comprising of steps of:

(a) providing a metal connecting terminal for electrical lead connection thereto;
(b) heating said terminal to a temperature above 450° C.;
(c) flowing a gaseous mixture comprising 5–15% hydrogen, balance selected from the group consisting of argon, nitrogen or helium over said heated terminal; and,



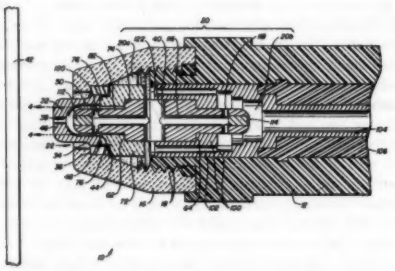
(d) applying a solder having a melting point not greater than 350° C. to said terminal in the region of said lead connection and permitting said solder to melt in the atmosphere of said gaseous mixture.

4,558,201

PLASMA-ARC TORCH WITH GAS COOLED BLOW-OUT ELECTRODE

Bruce O. Hatch, Lebanon, N.H., assignor to Thermal Dynamics Corporation, West Lebanon, N.H.

Filed Dec. 10, 1984, Ser. No. 679,913
Int. Cl.[4] B23K *9/00*
U.S. Cl. 219—121 PM **18 Claims**



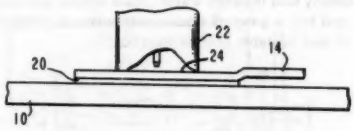
1. A cathode for use in a plasma arc cutting torch comprising:
a generally elongated electrode defining a central axis and a pair of opposite ends,
an axial passage within said electrode,
inserts in said axial passage within each of said opposite ends, so as to close off communication with the exterior of said electrode, and
a first transverse passage intermediate said opposite ends intercommunicating said axial passage with the exterior of said electrode.

4,558,202

WELDMENT FOR AUSTENITIC STAINLESS STEEL AND METHOD

Christopher Bagnall, and Marvin A. McBride, both of Hempfield, Pa., assignors to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed Aug. 17, 1983, Ser. No. 523,992
Int. Cl.[4] B23K *9/23*
U.S. Cl. 219—137 WM **17 Claims**



1. A defect-free weldment joining austenitic steel members which have a melting point lower than that of pure iron and which, when just below the solidus temperature, include at most only a very minor proportion of delta ferrite, said weldment comprising:
a weld nugget joining one of said stainless steel members to the other of said stainless steel members, said weld nugget comprising portions of said one member and said other member which have been melted and then solidified in an inert gas environment; and
a thin foil-like member substantially comprising iron positioned intermediate said one member and said other member proximate said weld nugget, said thin foil-like member having a melting point which is greater than the melting points of said stainless steel members, small unmelted portions of said thin foil-like members projecting into said weld nugget, and the portions of said weld nugget proximate said projecting portions of said thin foil-like member being relatively rich in iron; whereby delta ferrite is formed proximate said thin foil-like member projecting portions during solidification of said weld nugget.

10. The method of welding two austenitic stainless steel members which have a melting point lower than that of pure iron and which, when just below the solidus temperature, include at most a very minor proportion of delta ferrite, one of said stainless steel members being relatively thin, and the other of said stainless steel members after welding comprising the support for said one member, which method comprises:
placing between the portions of said stainless steel members which are to be welded, a thin foil-like member substantially comprising iron, and retaining in fixed and abutting relationship said stainless steel members and said thin foil-like member which is positioned therebetween, with one surface of said one stainless steel member being exposed;
placing proximate the exposed surface of said one stainless steel member and proximate the portion thereof to be welded a gas tungsten-arc welding torch, and maintaining an inert gas environment about said welding torch and the proximate exposed surface of said one stainless steel member;
applying an arc welding potential to said welding torch to heat to fusion the proximate portion of said one stainless steel member and also the portion of said other stainless steel member which is proximate thereto, with a substantial portion of said foil-like member which is proximate said fused stainless steel member portions also being melted to form a molten weld nugget; and
retaining said stainless steel members in fixed and abutting relationship during solidification and cooling to provide a weld nugget, with small unmelted portions of said higher-melting-point thin foil-like member remaining and projecting into said weld nugget; whereby the portions of said foil-like member which project into said solidified weld

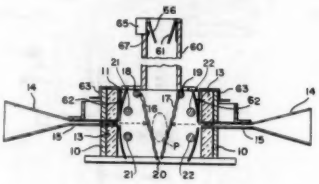
nugget have proximate thereto solidified weld nugget portions which are rich in iron and which display substantial delta ferrite when just below the solidus temperature of said weld nugget.

4,558,203

HEATING APPARATUS FOR PACKAGED FOODSTUFF

Karl A. Bauridl, 10649 Twilight Dr., St. Louis County, Mo. 63128

Filed Jan. 16, 1984, Ser. No. 570,986
Int. Cl.⁴ H05B *1/00;* **B65D** *83/00*
U.S. Cl. 219—214 **9 Claims**



1. In apparatus for heating foodstuffs packaged in radiant heat transparent wrappers, wherein the wrappers are heat penetrable and subject to destruction by heat, the improvement comprising:

(a) frame means defining a vertical pass through passage for packages of foodstuffs for gravity movement;

(b) a pair of vertically extending grid means operably carried dependently from upper ends by said frame means for relative movement between positions in which lower ends of said pair of grid means are in spaced relation for allowing a package of foodstuffs to pass by gravity drop through said frame means and to a heating position in which the lower ends of said pair of grid means are adjacently positioned to form a support for catching a package of foodstuffs;

(c) radiant energy heating means fixed in said frame so as to be adjacent each of said grid means for generating package heat;

(d) actuator means operably connected to said pair of grid means for moving said pair of grid means into said package support position and into said spaced relation for release of a package; and

(e) air flow directing means connected to said frame means in position for directing the air flow past said heating means and directly onto a package caught by said pair of grid means whereby said package wrapper is protected from heat burn.

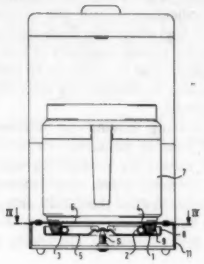
4,558,204

ELECTRIC CONTINUOUS FLOW WATER HEATER ASSEMBLY FOR A BEVERAGE MAKING MACHINE

Ingo Bleckmann, Ignaz-Rieder-Kai 11, A-5020 Salzburg, Austria

Filed Mar. 9, 1984, Ser. No. 587,924
Int. Cl.⁴ H05B *3/68;* **A47J** *31/54;* **F24H** *1/10*
U.S. Cl. 219—283 **14 Claims**

1. A continuous flow heater assembly for an electrically heated apparatus for preparing an infusion beverage, comprising a thermally conductive and heat resistant mounting plate having a raised edge portion defining a generally dish-like member; a generally annularly configurated electrical heater element carried on the upper surface of the mounting plate; a generally annularly configurated water flow pipe carried on the upper surface of the mounting plate within the annular configuration of the heater element, the heater element and the water pipe being connected in heat-conducting relationship to each other and to the mounting plate; a thermally conductive support plate having an upper surface for supporting a container containing an infusion beverage, and having an undersurface disposed in contact with the heater element, and raised edge portion of said mounting plate being spaced from the



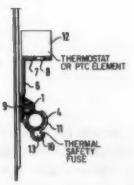
adjacent side surface portion of the heater element and extending upwardly to a position adjacent but spaced from the undersurface of said support plate.

4,558,205

ELECTRIC CONTINUOUS FLOW WATER HEATER HAVING DUAL TEMPERATURE SAFETY LIMITING DEVICES

Ingo Bleckmann, Ignaz-Rieder-Kai 11, A-5020 Salzburg, Austria

Filed Apr. 11, 1984, Ser. No. 599,079
Claims priority, application Fed. Rep. of Germany, Apr. 13, 1983, 8310976[U]
Int. Cl.⁴ H05B *1/02;* **A47J** *31/56;* **F24H** *1/10*
U.S. Cl. 219—283 **10 Claims**



1. An electrical, continuous flow heater for a domestic appliance, comprising an assembly of an electrical heater element and a water flow pipe adapted to be heated by the heater element; a heat conductive bridge member in contact with at least one of said heater element and said water flow pipe and extending thereacross into the vicinity of the domestic appliance to be heated; and at least first and second thermally responsive current supply-limiting elements carried on the bridge member in mutually spaced relationship and in thermal contact with the bridge member, said current supply-limiting elements being electrically connected in series with each other and with said heater element and being operable independently of each other, one being located at one side of said assembly and the other at the opposite side of said assembly.

4,558,206

ELECTRIC HEATING APPARATUS FOR PROVIDING FREEZE PROTECTION FOR FLUID-CONTROL DEVICES AT WELL SITES

Randell D. Ball, 1141 Elk, Yukon, Okla. 73099

Filed Sep. 19, 1983, Ser. No. 533,069
Int. Cl.⁴ H05B *1/02, 3/34;* **E03B** *7/10;* **F16K** *49/00*
U.S. Cl. 219—301 **7 Claims**

1. An apparatus for heating a fluid-control device disposed at a well, comprising:

a heating pad for applying heat to a first portion of a fluid-control device disposed at a well, said pad including:

a flexible member having a central web and four legs extending outward from said web;

means for connecting a first one of said legs to a second one of said legs about the fluid-control device;

means for connecting a third one of said legs to a fourth one of said legs about the fluid-control device;

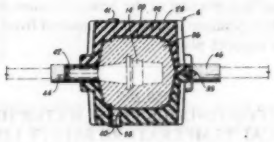
heating element means, disposed in said flexible member, for generating heat in response to electricity; and

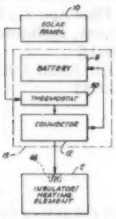
conductor means for conducting electricity to said heating element means;

an insulated housing having an interior cavity defined therein, said housing including a first member, a second member and means for connecting said first member to said second member about said heating pad when said apparatus is installed on the fluid-control device;

a rechargeable battery;

a solar panel for generating electricity to recharge said battery;





first connector means for electrically connecting said battery to said conductor means, said first connector means including first thermostatic control means, disposed in said housing, for providing an energizing electrical path between said battery and said conductor means, said energizing electrical path disconnectable in response to said first thermostatic control means sensing within said housing a temperature exceeding a first reference level; and

second connector means for electrically connecting said solar panel and said battery, said second connector means including second thermostatic control means for providing a recharging electrical path between said solar panel and said battery, said recharging electrical path disconnectable in response to said second thermostatic control means sensing a temperature exceeding a second reference level, said second reference level being at least as great as said first reference level.

4,558,207

ELECTRIC FLUID HEATER HAVING COMBINED HEATING AND FLOW CONTROL MECHANISM

Ralph S. Litterst, 721 Mira Vista Dr., SE., Huntsville, Ala. 35802

Continuation-in-part of Ser. No. 394,318, Jul. 1, 1982, abandoned. This application Aug. 3, 1984, Ser. No. 637,981

Int. Cl.⁴ H05B *1/02;* **F24H** *1/20;* **H01H** *9/06*

U.S. Cl. 219—308 **12 Claims**

1. An apparatus for heating and controlling the flow rate of a fluid comprising, in combination:

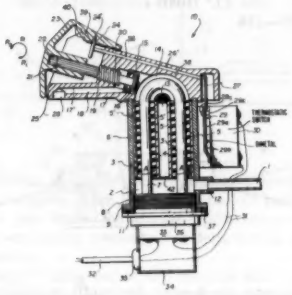
a fluid inlet;

a chamber in communication with said fluid inlet;

electric heating means in said chamber for heating the fluid;

a fluid outlet in communication with said chamber, said inlet, said chamber and said outlet forming a flow path;

thermostat means for setting maximum temperature of the fluid, said thermostat means including heat-responsive means positioned in vicinity of said flow path and responsive to heat therefrom and heating current passing means for supplying current to said heating means, said heating current passing means being responsive to and controlled by said heat responsive means;



valve means in said flow path for controlling the flow therethrough;

flow rate control means and heating control means including a single selectively manually operable control instrumentality arranged to respectively open and close said valve means and to enable and disable said heat responsive means.

4,558,208

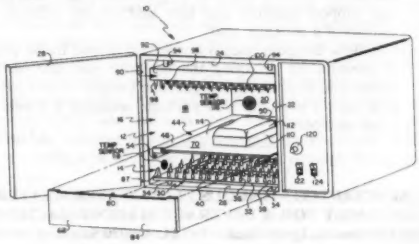
HEATING STRUCTURE FOR AN OVEN

Eugene J. Sturdevant, Wilmington, Del., and John F. Daniels, Paoli, Pa., assignors to Harry Hill Associates, Philadelphia, Pa.

Filed May 12, 1983, Ser. No. 493,936

Int. Cl.⁴ H01T *19/04*

U.S. Cl. 219—399 **10 Claims**



1. An enhanced heating structure for an oven having a bottom, a top, and sidewalls providing a housing comprising:

a platform supported on the bottom of the oven;

a plurality of spaced apart needle electrodes supported on said platform and projecting upward therefrom;

a heater element supported by the oven housing electrically isolated from and located adjacent said needle electrodes and connected to an electrical power supply;

an electrically conducting flat plate;

means on the oven housing supporting said flat plate above and spaced from and electrically insulated from said needle electrodes and said heater element, said means and said flat plate forming within the oven housing an enclosure of

selected volume for enclosing said needle electrodes and said heater element; and

means for generating a high voltage field between said flat plate and said needle electrodes for increasing the rate of heat transfer from said heater element to said flat plate.

4,558,209

LOW POWER ELECTRICAL HEATING DEVICE

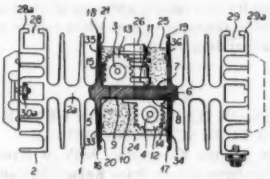
Joachim Hess, Schröplerstr. 37, D-8070 Ingolstadt, Fed. Rep. of Germany

Filed Jan. 9, 1985, Ser. No. 689,919

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1984, 3408398

Int. Cl.⁴ H05B *3/06, 3/50*

U.S. Cl. 219—530 **11 Claims**



1. In a low power electrical heating device for use in inhibiting the condensation of moisture in the housing of a piece of electrical equipment, which device comprises a heat source including at least one electrical resistor adapted to be connected to the main current circuit;

the improvement comprising that:

(a) said heat source includes an electrical resistor encased in an outer cover of thermally conductive material, said cover having a first flat surface at one portion of its exterior periphery,

(b) a finned heat radiating body of thermally conductive material defines a second flat surface, said resistor being supported by said heat radiating body with said first flat surface of the former in flush engagement with said second flat surface of the latter for direct heat transfer from said resistor to said heat radiating body, and

(c) said resistor with its outer cover is embedded in a mass of potting compound admixed with a quantity of particles of thermally conductive material, said mass of potting compound providing protection for said resistor against attack by dust and moisture and, through the presence of said thermally conductive particles therein, enhancing the heat transfer between said resistor and said heat radiating body.

4,558,210

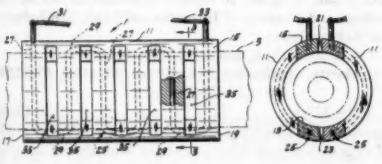
ELECTRIC CAST-METAL HEATER

John F. Leary, Batavia, Ill., assignor to Watlow Electric Manufacturing Company, St. Louis, Mo.

Filed Aug. 3, 1984, Ser. No. 637,283

Int. Cl.⁴ H05B *3/58*

U.S. Cl. 219—535 **4 Claims**



1. An electric heater comprising a generally semi-cylindric metal casting having an inside face adapted for engagement with a surface to be heated, such as the barrel of an extruder, an outside face, opposite ends, and an electric heating element of sinuate shape cast in said casting between said inside and outside faces thereof, said heating element having a plurality of generally parallel sections lying in generally parallel planes extending crosswise with respect to the casting at intervals spaced lengthwise thereof, and a plurality of bridging sections extending generally lengthwise of the casting connecting said parallel sections to form a series of sinuations, said heating element having ends protruding from the casting to form terminations adapted for connection to an electrical power source, said casting having a plurality of ventilation openings therein located between at least some of the parallel sections of said heating element and extending generally circumferentially with respect to the casting for permitting outside air to flow inwardly through said openings directly to said surface for ventilating and cooling it.

4,558,211

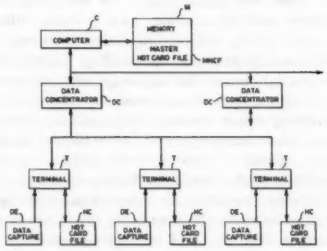
TRANSACTION TERMINAL SYSTEM

Patrick Berstein, Thornhill, Canada, assignor to Imperial Oil Limited, Toronto, Canada

Filed May 23, 1983, Ser. No. 497,061

Int. Cl.⁴ G06K *5/00*

U.S. Cl. 235—380 **4 Claims**

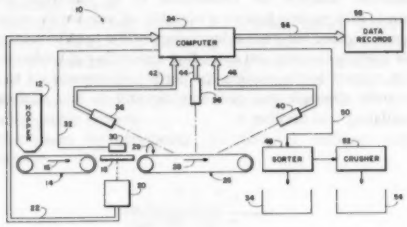


1. A transaction terminal system comprising a plurality of intelligent transaction terminals each comprising a data store and means for capturing transaction information and data relating to credit cards presented to authorize transactions, and a central data processing system including a data store accessible by said terminals on an intermittent basis for downloading of data relating to transactions and stored in said terminal data stores and updating of other data stored in said terminal data stores, a master hot card file forming part of the central processing system data store and organized to store data identifying hot cards together with data indicative of the likelihood of a hot card being presented in a particular location, local hot card files forming part of the data store of each of said terminals and organized to store data identifying hot cards, said local hot card files being of substantially smaller capacity than said master hot card file, means associated with each terminal to compare data captured from a card by said capture means with data stored in its local hot card file and to respond to detection of a hot card, and the central processing system being configured intermittently to review data stored in the master hot card file to identify subsets of hot cards most likely to be presented in particular localities, and to download data from such subsets to update the local hot card files of terminals located in those localities.

4,558,212
CONTAINER REDEMPTION METHOD AND APPARATUS

Alfred A. Hampson, Portland, Oreg., assignor to Can and Bottle Systems, Inc., Portland, Oreg.

Filed Jan. 17, 1983, Ser. No. 458,350
Int. Cl.⁴ G06K *15/00*
U.S. Cl. 235—383 **5 Claims**



1. Apparatus for the selective redemption-processing of authorized, redeemable beverage containers, and the like, of the type bearing externally readable, redemption-significant, coded indicia including a general UPC-type indicia on the side of the container and region specific indicia on an end of the container comprising

means defining an intake station for receiving such containers and for delivering the same downstream in the apparatus,

automated reading means disposed adjacent and downstream from said intake station for accepting delivered containers, and for reading, and deriving information from, such indicia, said reading means including first and second reading structure for reading, respectively, the UPC-type indicia and the region specific indicia, and

programmed intelligence means operatively connected to said reading means for acquiring and interpreting such derived information, operable, with respect to each accepted container, in response to the acquisition of related derived information which reflects authorized container redeemability, to effect a redemption-cycle operating procedure whereby the associated container is retained for further handling, and management control data is generated regarding such retained container, and in response to the acquisition of related derived information which reflects non-authorized container redeemability, to effect a rejection-cycle operating procedure whereby the associated container is rejected from further redemption handling.

4,558,213
PICKUP LEVEL CONTROL DEVICE FOR A SYSTEM FOR READING OUT RECORDED INFORMATION

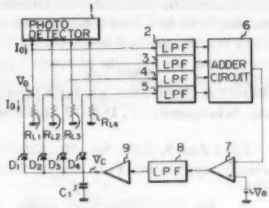
Koki Aizawa; Yoshiyuki Takizawa; Akira Haeno, and Akira Motoyama, all of Tokorozawa, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed May 31, 1983, Ser. No. 499,357
Claims priority, application Japan, Jun. 1, 1982, 57-093286
Int. Cl.⁴ H01J *40/14*
U.S. Cl. 250—214 R **5 Claims**

1. A pickup level control device for a system for reading out recorded information having a pickup which produces a plurality of pickup output signals, comprising:

dc level separating means for separating dc components of said pickup output signals and producing a plurality of dc signals;

adding means for adding said dc signals of said dc level separating means and producing an adder output signal; and

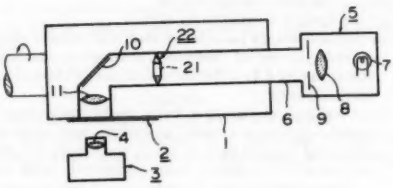


a control means for controlling a voltage level of said pickup output signal in response to said adder output signal produced by said adding means.

4,558,214
TRANSMISSION ILLUMINATION DEVICE IN A PICTURE SCANNING DEVICE

Teruo Fujii, and Mikizo Katsuyama, both of Kyoto, Japan, assignors to Dainippon Screen Seizo Kabushiki Kaisha, Japan

Filed Sep. 6, 1983, Ser. No. 529,605
Claims priority, application Japan, Oct. 4, 1982, 57-174158
Int. Cl.⁴ H01J *3/14*
U.S. Cl. 250—216 **4 Claims**



1. A transmission illumination device in a picture scanning device, comprising:

a lamp house disposed in an original picture drum and is moveable along an axial direction in synchronization with a light receiving head which moves along the axial direction on the exterior of the original picture drum,

the lamp house comprising a lamp, an annular convex lens and a condenser lens, thereby producing on an original picture on the original picture drum an illuminated region consisting of an illuminated spot and an annular illuminated area surrounding the illuminated spot.

4,558,215
OBJECT DETECTING APPARATUS

Makoto Kaneko; Susumu Tachi, and Kiyoshi Komoriya, all of Ibaraki, Japan, assignors to Agency of Industrial Science and Technology and Ministry of International Trade and Industry, both of Tokyo, Japan

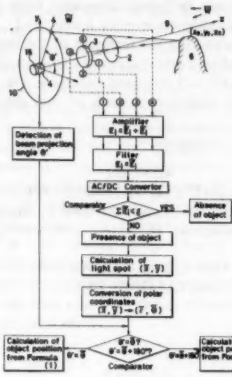
Filed Feb. 8, 1983, Ser. No. 464,914
Claims priority, application Japan, Mar. 30, 1982, 57-51580
Int. Cl.⁴ G01B *11/24*
U.S. Cl. 250—222.1 **20 Claims**

1. Apparatus for detecting the presence of an object within a spatial region disposed downstream of said apparatus, comprising:

an axis extending through said spatial region within which said object to be detected is disposed;

means for projecting a beam of light in said downstream direction into said spatial region so as to intersect said axis at a predetermined angle with respect to said axis;

means for rotating said light beam projecting means in a circle about said axis while maintaining said predetermined angle of said projecting means with respect to said axis so as to define a conical detecting surface, within said spatial region within which said object to be detected is disposed, for illuminating said object to be detected; and



optical means, disposed upon said axis upstream of said spatial region within which said object to be detected is disposed, for receiving light reflected from said illuminated object,

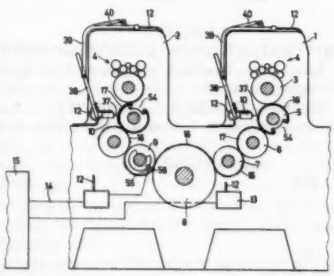
whereby said object to be detected is capable of being detected.

4,558,216

SAFETY DEVICE FOR DETERMINING IMPROPER TAKEOVER OF SHEETS BY A BLANKET CYLINDER

Anton Rodi; Udo Blasius, both of Leimen, and Dieter Uhrig, Eberbach, all of Fed. Rep. of Germany, assignors to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

Filed Dec. 1, 1982, Ser. No. 445,698
Claims priority, application Japan, Jun. 1, 1982, 57-92254
Int. Cl.⁴ G01V *9/04*; B65H *25/02*
U.S. Cl. 250—223 R **14 Claims**



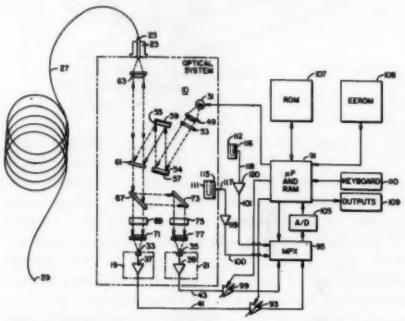
1. Checking device for protecting against faults arising from a paper wind-up in a rotary printing machine having a printing unit with a blanket cylinder formed with a cylinder channel and a printing-unit protecting grid, foldable into and out of operating position the checking device including at least one control device disposed in stationary relationship with respect to and adjacent the blanket cylinder and upstream, in travel direction of paper through the printing machine, of a location at which the paper wind-up is produced and comprising a photoelectric sensor formed as a contrast measurement detector for scanning the blanket of the blanket cylinder and generating a signal when a print product is present, said sensor being mounted on the protecting grid at a lower region thereof and being foldable out of operating position together with said protecting grid.

4,558,217

MULTIPLEXING AND CALIBRATION TECHNIQUES FOR OPTICAL SIGNAL MEASURING INSTRUMENTS

Ronald V. Alves, Palo Alto, Calif., assignor to Luxtron Corporation, Mountain View, Calif.

Continuation-in-part of Ser. No. 357,645, Mar. 12, 1982, abandoned. This application Feb. 25, 1983, Ser. No. 468,189
Int. Cl.⁴ G02B *5/14*
U.S. Cl. 250—227 **11 Claims**



1. In an optical condition measuring system adapted to provide a separate condition indication from a plurality of independent optical signals that are each separately carried by at least one of a plurality of optical fibers from one end to another end thereof, an improved optical signal processing system, comprising:

means grouping together said another end of said plurality of optical fibers in a given cross-sectional pattern for forming said plurality of light signals in said pattern,

an array of light detectors arranged substantially in said given cross-sectional pattern for a separate detector to receive the light from said another end of a different at least one of said plurality of optical fibers, and

a signal receiving optical system positioned to image onto said array of detectors through at least one common optical element the grouped light signals from said another end of said optical fibers.

4,558,218

HEAT PIPE OVEN MOLECULAR BEAM SOURCE

Robert E. Drullinger, Boulder, Colo., assignor to The United States of America as represented by the Secretary of Commerce, Washington, D.C.

Filed Aug. 1, 1984, Ser. No. 636,769
Int. Cl.⁴ H05H *3/02*
U.S. Cl. 250—251 **18 Claims**

1. A molecular beam source comprising:

a porous substrate having a constant diameter central cavity with at least one opening to the exterior of the substrate;

working material nearly saturating said substrate such that a

thin liquid layer of said working material covers the surface of the central cavity; and

means for maintaining the temperature of said substrate slightly above the melting point of said working material.

4,558,219

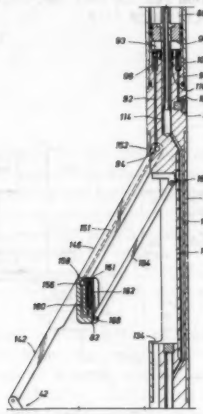
METHOD AND APPARATUS FOR DETERMINING FLOW CHARACTERISTICS WITHIN A WELL

Aladain J. LeBlanc, and Robert A. Turney, both of Houston, Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Jul. 6, 1982, Ser. No. 395,198

Int. Cl.[4] G01V *5/08*

U.S. Cl. 250—260 **8 Claims**



1. An apparatus for use in evaluating fluid flow rates within a well traversing subsurface earth formations, comprising:

an elongated housing member;

at least one support member coupled to said housing member and selectively extendable therefrom; and

means for controllably releasing a tracer substance into said well fluid flow in a generally longitudinal path generally parallel to the longitudinal axis of said housing member, said releasing means supported adjacent said housing member by said support member.

4,558,220

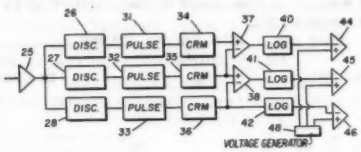
RADIOACTIVITY WELL LOGGING

Hilton B. Evans, Englewood, Colo., assignor to Gearhart Industries, Inc., Fort Worth, Tex.

Filed Oct. 2, 1981, Ser. No. 307,925

Int. Cl.[4] G01V *5/12*

U.S. Cl. 250—269 **26 Claims**



1. In a method of logging a well extending from the earth's surface to a subterranean location to characterize a medium at said location comprising a plurality of components having radiation attenuation coefficients which vary as a function of the energy of applied penetrating radiation, the steps comprising:

(a) irradiating said medium with gamma radiation having a plurality of discrete energy levels within a range wherein the predominant attenuation mechanism is Compton scattering whereby the absorption of applied radiation within said medium is different at each of said energy levels,

(b) detecting gamma radiation emanating from said medium for each of said discrete energy levels, and

(c) selectively measuring the intensity of the detected radiation for each of said discrete energy levels and correlating the intensities of said detected radiation with the intensities of applied radiation at each of said discrete energy levels.

4,558,221

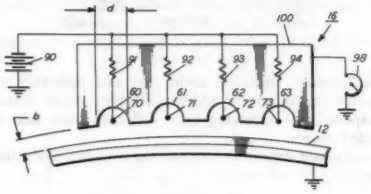
SELF LIMITING MINI-COROTRON

Robert W. Gundlach, Victor, and Richard F. Bergen, Ontario, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed May 2, 1983, Ser. No. 490,825

Int. Cl.[4] G03G *15/00*

U.S. Cl. 250—325 **9 Claims**



9. A self limiting mini-corona generator device for charging a receptor surface, comprising:

a plurality of shield and means for applying a voltage to said plurality of shields; and

a plurality of corona emission means individually located within each of said plurality of shields, each of said corona emission means being connected to a power supply and wherein the distance from each of said corona emission means to said receptor surface is greater than the radius of each of said plurality of shields in order to provide control of the potential on said receptor surface.

4,558,222

INFRARED RADIATION DETECTING SYSTEMS

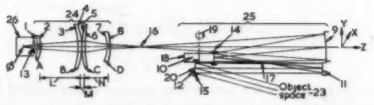
Iain A. Neil, Strathblane, Scotland, assignor to Barr & Stroud Limited, Glasgow, Scotland

Filed Oct. 12, 1983, Ser. No. 542,252

Claims priority, application United Kingdom, Nov. 6, 1982, 8231750

Int. Cl.[4] G01J *5/08*

U.S. Cl. 250—353 **5 Claims**



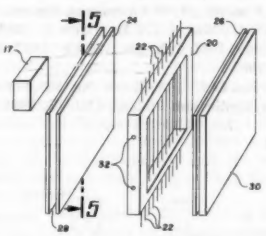
1. An infrared radiation detecting system comprising an optical imaging system for receiving radiation from a field of view and delivering said radiation to an image surface, a detector unit having a detecting surface formed by one or more detector elements located in a cold-shield housing having a cooled aperture which limits the radiation acceptance angle of

the detector unit whereby the detector unit is background limited, and a transfer lens system intermediate said image surface and said detector unit for transferring infrared radiation therebetween and focussing the transferred radiation at the detecting surface of said detector unit, wherein said transfer lens system is composed of four lens elements that one of the lens elements adjacent said image surface being negatively powered and the other three of said lens elements being positively powered, the relative powers of said four lens elements being selected with respect to the curvature of said image surface to provide a field curvature of radiation focussed at the detecting surface coincident with the physical curvature of said detecting surface, and the respective axial dimensions of the air space between the two lens elements proximal the image surface and between the two lens elements proximal the detecting surface being substantially greater than that of the remaining air space of the transfer lens system, said axial dimensions being selected to locate the pupil formed by the transfer lens system coincident with said cooled aperture, the overall power of the transfer lens system being selected to dimension the pupil formed by the transfer lens system to match the dimension of the cooled aperture and the curvature of the refractive surfaces of said lens elements being selected to provide low field and pupil aberrations.

4,558,223
ELECTRONIC X-RAY RECORDING

John H. Broadhurst, Golden Valley, and Marvin B. Bacaner, Minneapolis, both of Minn., assignors to Sysmed, Inc., Eden Prairie, Minn.

Continuation-in-part of Ser. No. 239,313, Mar. 2, 1981. This application Feb. 5, 1982, Ser. No. 345,940
Int. Cl.⁴ G01T *1/18*
U.S. Cl. 250—374 **41 Claims**



1. A method for forming a two-dimensional diagnostic x-ray shadowgram comprising:

placing the subject between a mono-energetic x-ray source and a gas ionization chamber x-ray detector;

matching the energy of the x-ray source and that of the detector ionization gas so that the x-rays produced by the source have an energy level just above an absorption edge of the gas;

irradiating the subject with x-rays from the x-ray source;

detecting the x-ray shadow image in the gas ionization chamber; and

electronically processing the detected image information to produce a visible shadowgram.

4,558,224
COUNTERFEIT BILL WARNING DEVICE

Jerome T. Gober, Chicago, Ill., assignor to Imperial Inc., Chicago, Ill.

Filed May 26, 1983, Ser. No. 498,635
Int. Cl.⁴ G01N *21/64*
U.S. Cl. 250—461.1 **12 Claims**

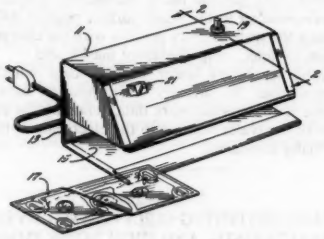
1. A device for detecting counterfeit paper currency utilizing the characteristic fluorescence of genuine paper currency, said device comprising,

an ultraviolet lamp for illuminating paper currency to be tested,

a housing supporting said ultraviolet lamp,

a stage supporting the paper currency, said stage being mounted to the housing and illuminated by the ultraviolet lamp,

a sensor mounted within the housing and responsive to the fluorescent radiation from the paper currency for providing a variable signal proportional to the intensity of the fluorescence, and

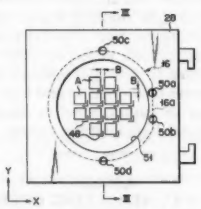


means responsive to the variable signal from said sensor for providing a physical indication of the degree of fluorescence of the paper currency including adjustable means for providing a first threshold signal corresponding to the fluorescence of genuine paper currency, means for providing a second signal corresponding to the fluorescence of the illuminated paper currency, and a variably responsive indicator which responds to second signal in excess of the first threshold signal.

4,558,225
TARGET BODY POSITION MEASURING METHOD FOR CHARGED PARTICLE BEAM FINE PATTERN EXPOSURE SYSTEM

Mineo Gotou, Kawasaki; Ryoichi Yoshikawa, Yokohama; Toru Tojo, Yamato, and Hirotsugu Wada, Machida, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Aug. 29, 1983, Ser. No. 527,486
Claims priority, application Japan, Sep. 9, 1982, 57-157005
Int. Cl.⁴ G01B *15/00*; G03F *9/00*
U.S. Cl. 250—491.1 **10 Claims**



1. A method for measuring the actual position of a semiconductor wafer having a straight edge portion when the water is aligned with a charged particle optical system of a pattern forming apparatus for forming desired fine circuit patterns on the wafer by using a charged particle beam such as an electron beam, said method comprising the steps of:

scanning an edge portion of the wafer at plural points including said straight edge portion by said charged particle beam, and obtaining primary wafer position data when the

wafer having chip alignment marks is positioned in the pattern forming apparatus, the chip alignment marks being included in a non-circuit area defined between a plurality of chip field areas and corresponding to the plurality of chip field areas, and the fine circuit patterns being formed on the plurality of chip field areas, respectively;

defining a surface portion of the semiconductor wafer to be illuminated with the charged particle beam, said wafer surface portion corresponding to the non-circuit area and including the chip alignment marks of the wafer in accordance with the primary wafer position data;

radiating the charged particle beam onto the wafer such that the charged particle beam exclusively irradiates an area corresponding to the wafer surface portion defined;

scanning the wafer surface portion with the charged particle beam to detect chip alignment marks; and

obtaining secondary wafer position data which is more precise than the primary wafer position data in accordance with detected mark data, whereby the actual position of the wafer relative to the electronic optical system is finally measured.

4,558,226

VOLTAGE DETECTING CIRCUIT WITH HYSTERESIS CHARACTERISTIC AND HIGH NOISE IMMUNITY

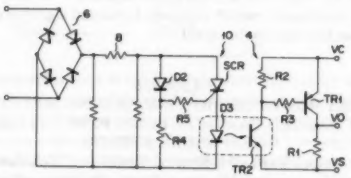
Junji Takada; Masayuki Minamitake, and Satoshi Tamegai, all of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki and Toshiba Components Co., Tokyo, both of, Japan

Filed Jul. 6, 1983, Ser. No. 511,280

Claims priority, application Japan, Jul. 7, 1982, 57-117931

Int. Cl.[4] G01R *31/00*

U.S. Cl. 250—551 **9 Claims**



1. A voltage detecting circuit comprising:

an input circuit section indluding light emitting means and current supplying means for supplying a current to said light emitting means in response to an input voltage and having a hysteresis characteristic with respect to the input voltage; said current supplying means comprising a thyristor having a gate and an anode-cathode path connected in series to said light emitting means, and a gate driving circuit for driving the gate of said thyristor; and

an output circuit section including light receiving means optically coupled to said light emitting means, and signal generating means connected to said light receiving means for generating an output signal in response to the light emitted from said light emitting means.

4,558,227

METHOD OF CONTROLLING OPERATION OF THERMOELECTRIC POWER STATION

Sadao Yanada; Naganobu Honda, both of Hitachi; Hisanori Miyagaki, Hitachiohta, and Seiitsu Nigawara, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

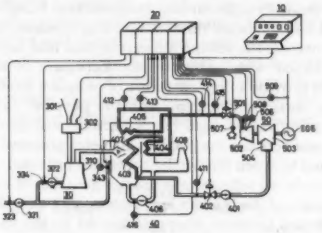
Filed Jun. 8, 1984, Ser. No. 618,676

Claims priority, application Japan, Jun. 14, 1983, 58-106271

Int. Cl.[4] F01D *19/02*

U.S. Cl. 290—40 R **7 Claims**

1. A method of controlling the operation of a thermoelectric power generating plant having a boiler for generating steam and a steam turbine driven by said steam, for operating the plant within minimum time taking into consideration the thermal stress occurring in the metals of various parts of the plant, the method comprising: estimating the thermal stresses at a future moment in stress-evaluation portions assumed on metal portions of said boiler and said turbine; selecting one of the



estimated thermal stresses in accordance with the state of operation of said thermoelectric power generating plant; and controlling the boiler steam temperature or load and speed of the turbine are controlled in accordance with the selected estimated thermal stress.

4,558,228

ENERGY CONVERTER

Jaakko Larjola, Jouseno, 54190 Konnunsuo, Finland

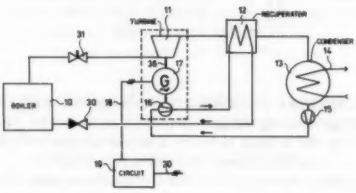
PCT No. PCT/FI82/00042, § 371 Date Jun. 6, 1983, § 102(e) Date Jun. 6, 1983, PCT Pub. No. WO83/01482, PCT Pub. Date Apr. 28, 1983

PCT Filed Oct. 8, 1982, Ser. No. 509,442

Claims priority, application Finland, Oct. 13, 1981, 813164

Int. Cl.[4] F01K *11/04*

U.S. Cl. 290—52 **7 Claims**



1. In an energy converter, comprising a feed pump having a pump rotor, a generator having a generator rotor, and a gas turbine having a turbine rotor driven by vapor of a circulating fluid, the feed pump rotor, generator rotor, and turbine rotor being mounted on a joint rotatable shaft, the improvement comprising

said joint shaft being rotatably mounted in gas-dynamic bearings utilizing the vapor of the circulating fluid,

said turbine rotor having a lower surface, a portion of which constitutes an abutment surface of a gas-static thrust bearing in which said joint shaft is mounted,

said shaft being disposed to extend substantially vertically, and

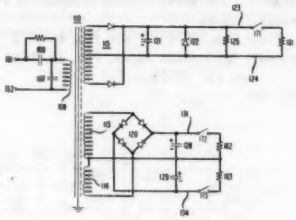
the feed pump, generator, and turbine being mounted on the joint shaft in that order, from bottom to top.

4,558,229

SERIES FERRORESONANT REGULATED RECTIFIER WITH ADDED CAPACITOR SHUNTING THE SATURATING REACTOR WINDING

Richard P. Massey, Westfield, and Purnell E. Rowe, Maplewood, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Apr. 30, 1984, Ser. No. 605,389
Int. Cl.[4] H02P *13/04*
U.S. Cl. 307—17 **2 Claims**



1. A series type ferroresonant regulator comprising:
an input means for accepting AC signals operating at substantially a single frequency,
a transformer having a saturating core in response to AC signals from the input means such that initial operation of the saturating core is in a linear region and changes into a saturating region within each half-cycle of the AC signal, the transformer including a primary winding coupled to the input means and at least a first secondary winding,
a ferrocapacitor having a first capacitance value and connecting the input means to the primary winding, and connected in series with the primary winding,
a second capacitor having a second capacitance value and connected in parallel with the primary winding,
the sum of the first and second capacitance values being a capacitance value series resonant with a linear region saturated inductance of the primary winding and saturating core and a ratio of the first and second capacitance values selected in accordance with a quality of a saturated inductance of the transformer so that a desired input/output voltage ratio is maintained and a voltage dividing action of the ferrocapacitor and the second capacitor significantly reduces a peak voltage across the primary winding, and
output means connected to the first and second secondary winding and including rectification means.

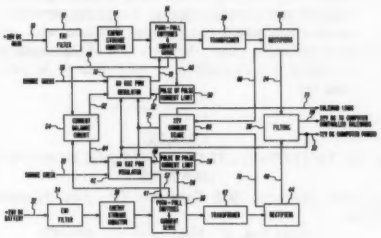
4,558,230

HIGH INTEGRITY DUAL INPUT POWER SUPPLY

Ralph E. Western, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Nov. 14, 1983, Ser. No. 551,385
Int. Cl.[4] H02J *9/00, 1/10*
U.S. Cl. 307—66 **4 Claims**

1. A multiple output power conditioner system operating from redundant and separate first and second dc sources comprising a first power converter powered by said first dc source and a second power converter powered by said second dc source;
each of said power converters comprising switching means and a power transformer, with said switching means operable to switch the associated power source to the primary winding of said power transformer in a push-pull fashion;
at least one secondary winding associated with each of said power transformers;
rectifying means connected to said secondary winding to develop a predetermined dc output voltage, each said dc output voltage from said first converter being connected in parallel with the corresponding dc output from the second one of said powr converters wherein said first and said second power converters are each capable of supplying requisite load power jointly, and alternatively, individually, wherein each of said first and second power converters and said dc output voltages are referenced to individually different ones of plural ground return planes;
including first and second pulse width modulator regulator means associated respectively, with each of said first and second power converter means;
each of said pulse width modulator regulator means effecting a predetermined periodic and alternative closing of first and second switches associated with each of said converter means to provide alternate ground returns for said dc sources through an associated individual one of said plural ground return planes;
wherein each of said converter means is operably connected with a current transformer having primary winding means through which input current flow through each of said first and second switches, said secondary winding means connected with a comparator means for developing a control signal for application to the associated pulse width



modulator regulator in the associated converter to effect pulse width modulation of that pulse width modulator to regulate and current limit the power switched to the power transformer primary winding of that converter; and
further comprising current transformer means associated with at least one of the secondary windings associated with the power transformers in each of said first and second converters for sensing the output current flow in that secondary winding, each of said current transformers having a secondary winding;
means for providing a resistance load to each of the secondary windings of said current transformers, means responsive to the summation of the outputs of each of said resistive loads being in excess of a predetermined reference level to develop a shutdown control signal, and
said shutdown control signal being applied to each of said pulse width modulator regulators associated with the said first and second converters to effect turn-off thereof in response to said shutdown control signal.

4,558,231

VARIABLE RATE BI-DIRECTIONAL SLEW CONTROL AND METHOD THEREFOR

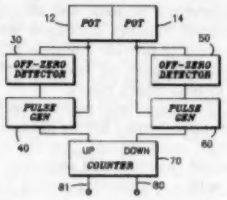
David W. Edwards, Scottsdale, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 1, 1982, Ser. No. 438,067
Int. Cl.[4] H03K *3/02*
U.S. Cl. 307;271 **13 Claims**

1. A variable rate slew control comprising:
a potentiometer having at least one tap capable of a change in position with respect to a reference point;
means for sensing position of said tap relative to said reference point, said sensing means being coupled to said potentiometer and including:
a terminal suitable for application of a source of potential, a first semiconductor device having at least one control

electrode coupled to said potentiometer, a first electrode coupled to said terminal and a second electrode; and

a second semiconductor device having at least one control electrode coupled to said second electrode of said first semiconductor device, a first electrode coupled to said potentiometer, and a second electrode coupled to said means for varying a slew rate; and



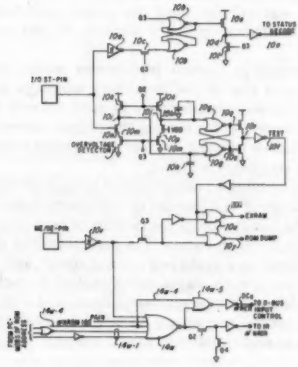
means for bi-directionally varying a slew rate of a digital signal, said varying means being coupled to said potentiometer and coupled to said means for sensing position so that when said tap changes position with respect to said reference point, the slew rate of the digital signal is changed corresponding to said change in position of said tap.

4,558,232

LEVEL DETECTOR CIRCUIT FOR MICROCOMPUTER DEVICES

Richard D. Simpson, 7930 Corporate Dr., #66, Houston, Tex. 77036

Filed Feb. 22, 1982, Ser. No. 350,958
Int. Cl.⁴ H03K *5/153, 5/24*
U.S. Cl. 307—351 **7 Claims**



1. A level detector circuit for a microcomputer input terminal or the like, comprising:

a bistable latch having first and second unbalanced input nodes and an output; said input nodes being unbalanced by impedance means of unequal value connected to the nodes;

means for precharging said first and second input nodes to equal voltage;

a first transistor having a current path connecting said first input node to ground and having a gate connected to said input terminal;

a second transistor having a current path connecting said second input node to ground and having a gate connected to a first logic level;

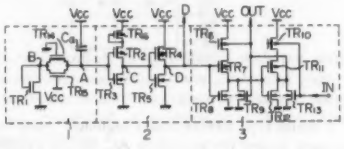
and means for gating said current paths of the first and second transistors to a conductive condition after said means for precharging has precharged said input nodes, whereby said bistable latch flips to one stable state if the input terminal is at a voltage substantially above said first logic level, or flips to another stable state if the input terminal is at about said first logic level or below.

4,558,233

CMOS POWER-ON RESET PULSE GENERATING CIRCUIT WITH EXTENDED RESET PULSE DURATION

Tutomu Nakamori, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Feb. 16, 1983, Ser. No. 467,075
Claims priority, application Japan, Feb. 16, 1982, 57-23309
Int. Cl.⁴ H03K *5/153, 17/687*
U.S. Cl. 307—362 **6 Claims**



1. A source voltage buildup detecting circuit which detects, after a source voltage is switched on, whether the source voltage is higher than a predetermined voltage and outputs a detecting signal accordingly, said source voltage buildup detecting circuit comprising:

a complementary metal-oxide semiconductor (CMOS) inverter having a threshold voltage and an input terminal and providing an output signal;

a level shifting element comprising one of a MOS transistor and a diode, operatively connected between the source voltage and said CMOS inverter; and

a voltage generating circuit, operatively connected to the input terminal of said CMOS inverter, said level shifting element supplying a voltage lower than the source voltage to said CMOS inverter as a working voltage, when the source voltage becomes lower than the predetermined voltage after the source voltage is switched on, said voltage generating circuit outputs a voltage higher than the threshold voltage of said CMOS inverter, when the source voltage becomes higher than the predetermined voltage, said voltage generating circuit outputs a voltage lower than the threshold voltage of said CMOS inverter, and when the source voltage reaches the predetermined value, the output signal of said CMOS inverter is inverted.

4,558,234

COMPLEMENTARY MOSFET LOGIC CIRCUIT

Yasoji Suzuki, Yokosuka, and Kenji Matsuo, Yokohama, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Division of Ser. No. 351,252, Feb. 22, 1982. This application Sep. 20, 1984, Ser. No. 652,429
Claims priority, application Japan, Feb. 25, 1981, 56-26376; Jun. 24, 1981, 56-97712; Nov. 6, 1981, 56-178162
Int. Cl.⁴ H03K *19/092, 19/003, 19/01, 19/094*
U.S. Cl. 307—446 **25 Claims**

1. A complementary MOSFET logic circuit for use with a TTL (Transistor-Transistor Logic) circuit, comprising:

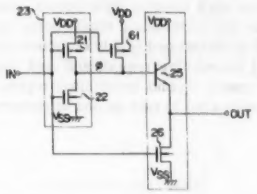
a signal input terminal means for receiving output signals from said TTL circuit;

a signal output terminal for supplying output signals to an external circuit;

a complementary MOSFET circuit means which comprises at least one P-channel MOSFET, at least one N-channel

MOSFET, an input terminal coupled to said signal input terminal means, and an output terminal, said complementary MOSFET circuit means having an input voltage characteristic determined by the ratio of the channel width of said P-channel MOSFET to that of said N-channel MOSFET, and which input voltage characteristic matches the output voltage characteristic of said TTL circuit;

a bipolar transistor circuit including a bipolar transistor whose collector-emitter path is connected between a first power source and said signal output terminal and whose base is connected to the output terminal of said complementary MOSFET circuit means;



a first MOSFET circuit comprising at least one N-channel MOSFET whose source-drain path is connected between a second power source and said signal output terinal and whose gate is connected to said signal input terminal means; and

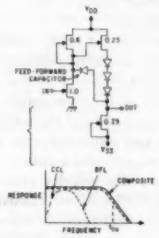
a second MOSFET circuit comprising at least one P-channel MOSFET whose source-drain path is connected between said first power source and the output terminal of said complementary MOSFET circuit means and whose gate is connected to said signal input terminal means, and whose threshold voltage is different from that of said P-channel MOSFET of said complementary MOSFET circuit means.

4,558,235

MESFET LOGIC GATE HAVING BOTH DC AND AC LEVEL SHIFT COUPLING TO THE OUTPUT

William A. White, Garland, Tex., and Mooshi R. Namordi, Acton, Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 31, 1983, Ser. No. 528,200
Int. Cl.[4] H03K *19/017, 19/094*
U.S. Cl. 307—450 **21 Claims**



1. A logic gate comprising:

(a) a logic circuit, comprising at least one input MESFET transistor having a gate electrode connected to receive at least one input signal, a drain connected to control a logic switch node in correspondence to said input signals and a source connected to a source of reference potential;

(b) an output node;

(c) a voltage level shifter circuit connected between said output node and said logic switch node to provide DC coupling and level shift from said logic switch node to said output node;

(d) a feed-forward capacitor, said feed-forward capacitor being connected to a-c couple said output node to said logic switch node;

(e) a load device connected between a positive bias potential and said logic switch node; and

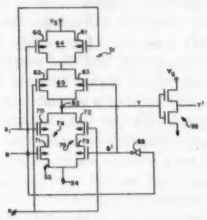
(f) a pull-down device connected between said output node and a negative bias potential.

4,558,236

UNIVERSAL LOGIC CIRCUIT

James L. Burrows, Merrimack, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Oct. 17, 1983, Ser. No. 542,878
Int. Cl.[4] H03K *19/094*
U.S. Cl. 307—465 **9 Claims**



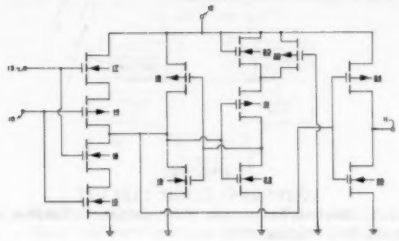
1. A universal logic element including a plurality of input terminals and an output terminal that transmits digital output signals, the universal logic element performing one of a plurality of logic operations on a pair of digital input signals, the logic operation being selected by the selective connection of the input signals and a digital control signal to the input terminals, the universal logic element comprising a digital multiplexer network including a pair of input signal terminals, to which are coupled one of the input signals and the control signal, and a select terminals, the input signal terminals and the select terminal together comprising the input terminals of the universal logic element, and an output terminal that comprises the output terminal of said universal logic element, the multiplexer network coupling either the input signal at said one of the input signal terminals or the control signal at the other of the input signal terminals to the output terminal depending on the condition of the input signal that is coupled to the select terminal, the signal at the output terminal comprising the logical result of the selected logic operation on the input signals, the multiplexer network further including two networks of field effect transistors of opposite conductivity types, the first network being connected between a terminal for connection to a first voltage source and said output terminal, and the second network being connected between said output terminal and a terminal for connection to a second voltage source having a voltage different from the voltage of said first voltage source, each of the networks comprising pairs of field effect transistors with one transistor in each pair being respective to one of the input signals and another transistor in each pair being responsive to the select signal to couple the voltage level of either the first or the second voltage source to said output terminal in response to selected conditions of said input signals and said select signal.

4,558,237

LOGIC FAMILIES INTERFACE CIRCUIT AND HAVING A CMOS LATCH FOR CONTROLLING HYSTERESIS

Robert L. Rabe, Maple Grove, and Paul J. Swan, Brooklyn Center, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Mar. 30, 1984, Ser. No. 595,573
Int. Cl.[4] H03K *19/094, 19/092, 19/017, 3/356*
U.S. Cl. 307—475 **15 Claims**



1. A transition circuit for interfacing logic gate circuits of differing logic family types, said transition circuit having a transition circuit input region adapted for connection to an input logic gate circuit of a first logic family type, where said first logic family type has a first family characteristic pair of logic state voltage levels, and said transition circuit having a transition circuit output region adapted for connection to an output logic gate circuit of a second logic family type, where said second logic family type has a second family characteristic pair of logic gate voltage levels, said first family characteristic pair separated by a voltage value differing from that voltage value separating said second family characteristic pair, said transition circuit comprising:

a first supply reduction threshold means having first and second terminal regions such that current will flow therebetween only if voltage therebetween exceeds a first threshold voltage value, said first supply reduction threshold means first terminal region being electrically connected to a first interconnection means adapted for electrical connection to a first electrical power supply means;

an input inverter means having first and second terminating regions, an output region and an input region serving as said transition circuit input region, said input inverter first terminating region being electrically connected to said first supply reduction threshold means second terminating region, said input inverter second terminating region being electrically connected to a second interconnection means adapted for connection to a second electrical power supply means;

an output inverter means having first and second terminating regions, an input region and an output region serving as said transition circuit output region, said output inverter input region being electrically connected to said input inverter output region, said output inverter first terminating region being electrically connected to a third interconnection means adapted for electrical connection to a third electrical power supply means, said output inverter second terminating region being electrically connected to a fourth interconnection means adapted for electrical connection to a fourth electrical power supply means; and

a latch means having a latch load region which is electrically connected to said input inverter output region, said latch means comprising:

a first latch inverter having first and second terminating regions, an input region and an output region serving as said latch load region, said first latch inverter first terminating region being electrically connected to said first interconnection means and said first latch inverter second terminating region being electrically connected to said second interconnection means;

a second supply reduction threshold means having first and second terminating regions such that a current will flow therebetween only if voltage therebetween exceeds a second selected threshold voltage value, said second supply reduction threshold means first terminating region being electrically connected to said first interconnection means; and

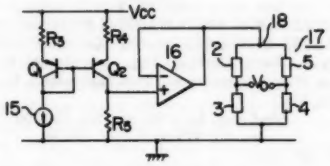
a second latch inverter having first and second terminating regions, an input region and an output region, said second latch inverter input region being electrically connected to said latch load region, said second latch inverter output region being electrically connected to said first latch inverter input region, said second latch inverter first terminating region being electrically connected to said second supply reduction threshold means second terminating region, and said second latch inverter means second terminating region being electrically connected to said second interconnection means.

4,558,238

PRESSURE TRANSDUCER USING INTEGRATED CIRCUIT ELEMENTS

Kazuji Yamada; Hideo Sato, both of Hitachi; Yukitaka Kitadate, Iwaki; Kanji Kawakami, Mito; Kazuo Kato, Ibaraki, and Takao Sasayama, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 29, 1983, Ser. No. 536,870
Claims priority, application Japan, Oct. 1, 1982, 170832
Int. Cl.[4] G01L *9/06*
U.S. Cl. 307—491 **6 Claims**



1. A pressure transducer comprising:

a semiconductor substrate;

a pressure sensor including a bridge connection of gauging resistors formed on said semiconductor substrate; and

a power supply connected to said pressure sensor for driving said pressure sensor, said power supply basically acting as a condtant current source and including at least two transistors formed on said semiconductor substrate, wherein

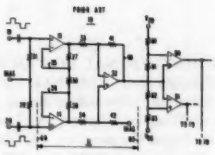
one of said transistors provides a collector current which is less in temperature dependency relative to that of the other transistor and, the other transistor has a collector circuit connected to said pressure sensor and providing a collector current corresponding to a sum of a substantially temperature-dependent current and a substantially temperature-independent current, and

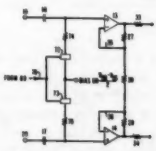
a ratio of said temperature-dependent current to said temperature-independent current is adjusted by selecting operation characteristics of said two transistors such that a temperature characteristic of the collector current of said other transistor is substantially inversely proportional to a temperature characteristic of said pressure sensor when said pressure sensor is driven with a constant voltage.

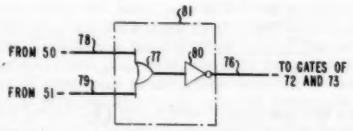
4,558,239
HIGH IMPEDANCE AMPLIFIER FOR AN IC CHIP

Suk K. Kim, Bridgewater, and Hanafy E. S. Meleis, New Providence, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Aug. 17, 1983, Ser. No. 523,967
Int. Cl.⁴ H03K *3/023*
U.S. Cl. 307—494 **9 Claims**







1. An integrated circuit comprising:

(a) differential amplifier means, connected to receive first and second inputs of a differentially coded input signal, for providing an output signal which is indicative of the difference between the first and second inputs;

(b) switchable input impedance means coupled to the amplifier means such that the magnitude of the resulting input impedance of the amplifier means is switched from one value to another in response to a control signal supplied to the switchable impedance means; and

(c) feedback means, responsive to the output signal, connected for supplying the control signal to the switchable input impedance means, whereby the magnitude of the input impedance of the amplifier means is switched from a higher value to a lower value when the difference between the first and second inputs goes inside a prescribed range and is switched from the lower value to the higher value when said difference goes outside the range.

4,558,240
MULTI MODE AMPLIFIER

Roger G. Stewart, Neshanic Station, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Apr. 21, 1983, Ser. No. 487,083
Int. Cl.⁴ H03K *5/24, 3/023;* **G01R** *19/165;* **G11C** *7/06*
U.S. Cl. 307—530 **12 Claims**

1. The combination comprising:

first and second power terminals for the application therebetween of an operating potential;

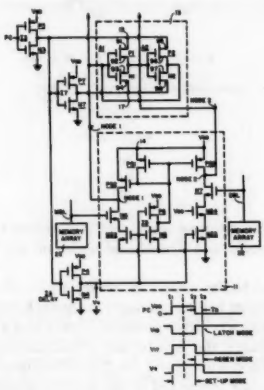
first and second input/output (I/O) nodes;

means for coupling signals to said input/output nodes including a preamplifier stage having first and second signal inputs and first and second signal outputs, said first signal output being connected to said first input/output node and said second signal output being connected to said second input/output node;

first, second, third and fourth transistors; said first and third transistors being of one conductivity type and said second and fourth transistors being of complementary conductivity type, each transistor having source and drain electrodes defining the ends of a conduction path and a control electrode;

means connecting the control electrodes of said first and second transistors to said first node;

means connecting the control electrodes of said third and fourth transistors to said second node;



means connecting the conduction path of said first transistor between said first power terminal and said second node and the conduction path of said second transistor between said second node and said second power terminal;

means connecting the conduction path of said third transistor between said first power terminal and said first node and the conduction path of said fourth transistor between said first node and said second power terminal; and

means for selectively controlling the operating potential applied across said first and second power terminals for operating said first, second, third and fourth transistors in the source follower mode during one time interval and in the common source mode during another time interval.

4,558,241
SENSE AMPLIFIER

Yasuo Suzuki, Yokohama; Hiroshi Hirao, and Yasuaki Suzuki, Both of Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jul. 2, 1984, Ser. No. 626,795
Claims priority, application Japan, Jun. 30, 1983, 58-118618
Int. Cl.⁴ H03K *5/24, 3/356;* **G01R** *19/165;* **G11C** *11/06*
U.S. Cl. 307—530 **2 Claims**

1. A sense amplifier comprising:

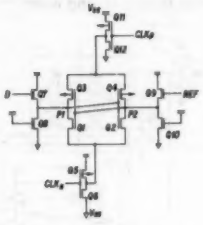
a flip-flop circuit including two n-channel MOS transistors having a common source and two p-channel MOS transistors having a common source; said n-channel transistors and said p-channel transistors forming pairs, each pair having a conduction channel connected in series and having a common gate connected to the node of the opposite pair of said n-channel transistor and said p-channel transistor;

a first switching circuit for switching the polarity of the potential supplied to said common source of said n-channel transistors of said flip-flop circuit;

a second switching circuit for switching the polarity of the

potential supplied to said common source of said p-channel transistors of said flip-flop circuit; wherein the polarity of the potential at the common sources is inverted in response to the transition between a stand-by sequence and a latching operation;

a first buffer circuit including a pair of n-channel MOS transistors having conduction channels connected in series between a positive potential source and a negative potential source, the gate of one of said transistors receiving read-out voltage signals from memory cells and the gate of the other of said transistors being connected to the



positive potential source, said transistors having a junction connected to a first of said nodes of said flip-flop circuit; and

a second buffer circuit including a pair of n-channel MOS transistors having conduction channels connected in series between a positive potential source and a negative potential source, the gate of one of said transistors receiving a reference voltage and the gate of the other of said transistors being connected to the positive potential source, said transistors having a junction connected to a second of said nodes of said flip-flop circuit.

4,558,242

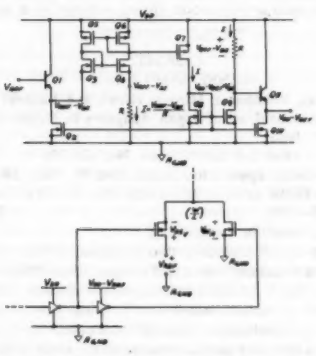
EXTENDED REFERENCE RANGE, VOLTAGE-MODE CMOS D/A CONVERTER

Michael G. Tuthill, Limerick, and Paschal Minogue, Portroe, both of Ireland, assignors to Analog Devices, Incorporated, Norwood, Mass.

Filed Feb. 11, 1983, Ser. No. 465,493

Int. Cl.[4] H03K *17/16, 17/693*

U.S. Cl. 307—577 **6 Claims**



1. In a digital-to-analog converter of the type comprising a plurality of complementary-driven MOS switch pairs for V_{ref} (reference voltage) and A_{gnd} (analog ground) respectively;

that improvement for assuring a close match between the "ON" resistances of the switch pairs over an extended range of values of V_{ref}, comprising:

a gate-voltage generator having means producing an A_{gnd} switch gate voltage which varies with changes in V_{ref}, and means coupling said switch gate voltage to said A_{gnd} switches.

4,558,243

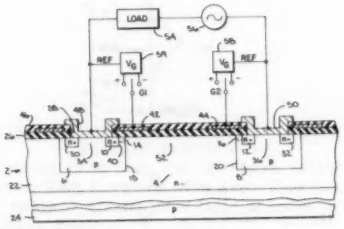
BIDIRECTIONAL POWER FET WITH SHORTING-CHANNEL OFF STATE

Herman P. Schutten, Milwaukee; James A. Benjamin, Waukesha, both of Wis., and Robert W. Lade, Fort Myers, Fla., assignors to Eaton Corporation, Cleveland, Ohio

Filed May 9, 1984, Ser. No. 608,401

Int. Cl.[4] H03K *17/60*

U.S. Cl. 307—584 **8 Claims**



1. In a split-gate bidirectional power FET having a common drift region of one conductivity type in a semiconductor substrate between a pair of spaced first and second channel-containing regions of opposite conductivity type in said semiconductor substrate, forming first and second PN junctions with said common drift region respectively and extending to a surface of said semiconductor substrate and first and second source regions of said one conductivity type adjacent to said first and second channel-containing regions respectively and forming third and fourth PN junctions therewith respectively,

first and second main electrodes contacting said first source and channel-forming regions and contacting said second source and channel-forming regions respectively, first and second insulated gate electrodes on said surface of said first and second channel-containing regions respectively and extending between said common drift region and the adjacent source region,

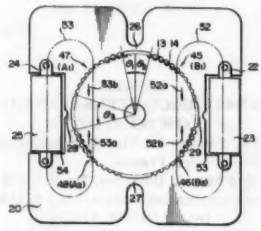
a source of alternating voltage impressed across said first and second main electrodes such that one of said first and second PN junctions is a forwardly biased injection junction and the other of said first and second PN junctions is a reverse biased junction,

an improved gating technique providing increased OFF state voltage blocking capability comprising providing a gate control voltage to one of said first and second gate electrodes which is adjacent to said one forwardly biased injection junction of sufficient intensity to create a one inversion channel region between said common drift region and the adjacent source region to prevent minority carrier injection and consequent bipolar action, the OFF blocking voltage being dropped across said other reverse biased junction between said common drift region and the other channel-containing region, said OFF state blocking voltage being higher without said forward biased injection junction and the bipolar action therefrom.

4,558,244
MICRO STEPPING MOTOR

Akira Nikaido, Tokyo; Takayasu Machida; Yasuhisa Hirosawa, both of Saitama, and Fumio Nakajima, Tokyo, all of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Mar. 12, 1984, Ser. No. 588,534
Claims priority, application Japan, Mar. 11, 1983, 58-40472
Int. Cl.[4] H02K *37/00*
U.S. Cl. 310—49 R 2 Claims



1. A micro stepping motor comprising a housing, a rotor shaft rotatably coupled to said housing, a disc-like permanent magnet magnetized in its axial direction rotor provided on said rotor shaft and having a plurality of rotor pole teeth formed therein at the outer periphery, a pair of rotor pole plates made of a magnetic material and fixed thereto at the opposite axial ends thereof, each of the rotor pole teeth in one of the rotor pole plates being out of phase relative to the corresponding rotor pole teeth in the other rotor pole plate at an electrical angle of 180 degrees, and a stator fixed to said housing having a plurality of stator pole teeth disposed around the outer periphery of said rotor, said stator pole teeth being divided into two pairs of stator pole tooth groups with one of the pairs being out of phase relative to the adjacent stator pole tooth groups by an electrical angle of 90 degrees, each of said two pairs including pole teeth out of phase relative to one another by an electrical angle of 180 degrees, said stator including at least one stator core formed therein around which a stator coil is wound provided to each of the stator pole teeth groups, each of the stator coils being subjected to supply of exciting currents in different phases, said stator core and at least one pair of said stator pole tooth groups defining a stator magnetic circuit supplying driving currents having different polarities to said one stator coil to steppingly drive said rotor.

4,558,245
ELECTRONICALLY COMMUTATED D.C. MOTOR

Rudolf Glassauer, and Josef Feigel, both of Landshut, Fed. Rep. of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Apr. 11, 1984, Ser. No. 598,956
Claims priority, application Fed. Rep. of Germany, Apr. 20, 1983, 3314239
Int. Cl.[4] H02K *7/00*
U.S. Cl. 310—67 R 13 Claims

1. An electronically commutated direct current motor comprising, in combination:

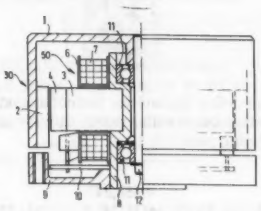
said direct current motor including a rotor having a dome-shaped body comprised of magnetizable material having a permanent magnet disposed on an inner circumference of said dome-shaped body, said rotor being a bipolar external rotor;

a stator located within said permanent magnet and including a yoke and a plurality of pole stacks and further including a longitudinal stator axis providing a longitudinal axis of symmetry through said motor;

a plurality of coilforms carried by said yoke having a plurality of stator windings wound on said coilforms, said stator winding for providing an alternating current field, said stator having a double T-shaped design with said stator winding being disposed on a common leg of said double T-shaped stator, said pole stacks and said yoke with said stator windings wound thereon being disposed asymmetrical to said longitudinal stator axis;

a plurality of stator pole stack extensions projecting in the same circumferential direction and separated from said permanent magnet by a constant air gap, said air gap located between said stator and said rotor, said stator alternating current field having a polar axis staggered parallel to said longitudinal stator axis by a fixed distance and said rotor permanent magnet having a polar axis orthogonal to a rotor neutral zone and displaced from said stator alternating current polar axis by an angle epsilon when said stator winding is currentless;

a rotor shaft penetrating said dome-shaped body for turning an external load;



a printed circuit board mounted adjacent to said coilform and supported by a mounting flange within said dome-shaped body, said printed circuit board having an electronic circuit for providing commutation of an input signal; and

a plurality of soldering pins mounted within a joining piece of said coilform for electrically connecting said stator windings to said printed circuit board, said coilform further including a plurality of flaps for turning onto said stator winding during assembly of said motor, and wherein said plurality of stator pole stack extensions having a magnetic resistance value which permits said rotor neutral zone to align with said plurality of stator pole stack extensions when said stator winding is currentless for providing an optimal starting torque.

4,558,246
LIQUID-SEAL TYPE MOTOR HAVING INSULATING OIL PRESSURE COMPENSATION

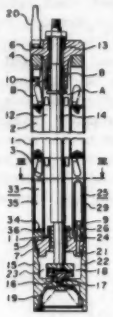
Kiyonori Tokumitsu, Fukuoka, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 18, 1984, Ser. No. 632,116
Claims priority, application Japan, Jul. 28, 1983, 58-139763; Jul. 28, 1983, 58-139764; Jul. 28, 1983, 58-139766
The portion of the term of this patent subsequent to Dec. 10, 2002, has been disclaimed.
Int. Cl.[4] H02K *5/10*
U.S. Cl. 310—87 8 Claims

1. A liquid-seal type motor comprising a cylindrical frame, a stator fixed inside said frame, a can placed at the inner circumferential side of said stator, a pair of end plates placed at both ends of and between said frame and said can to be sealingly connected thereto to thereby form an insulating oil enclosing part in which said stator is confined, a pair of brackets connected to the pair of said end plates respectively and a rotor placed in said can to be journaled by said brackets, said can, brackets and rotor defining a lubricating oil enclosing part, a pressure adjusting means having a flexible member for sealingly dividing said insulating oil enclosing part into first and second chambers, and an oil volume reducing member provided in said insulating oil enclosing part,

wherein said pressure adjusting means comprises a casing

which is fixed in said oil enclosing part and which has at its upper portion a small orifice and at its bottom an opening, and a sealed flexible member which is received in said



casing to define the interior thereof as said second chamber communicated with a region exterior to said insulating oil enclosing part.

4,558,247

LIQUID-SEAL TYPE MOTOR HAVING INSULATING OIL PRESSURE COMPENSATION

Sakuei Yamamoto, and Kiyonori Tokumitsu, both of Fukuoka, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

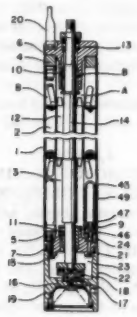
Filed Jul. 18, 1984, Ser. No. 632,122

Claims priority, application Japan, Jul. 27, 1983, 58-138521; Jul. 28, 1983, 58-139761; Jul. 28, 1983, 58-139762

The portion of the term of this patent subsequent to Dec. 10, 2002, has been disclaimed.

Int. Cl.⁴ H02K *5/10*

U.S. Cl. 310—87 **9 Claims**



1. A liquid-seal type motor comprising a cylindrical frame, a stator fixed inside said frame, a can placed at the inner circumferential side of said stator, a pair of end plates placed at both ends of and between said frame and said can to be sealingly connected thereto to thereby form an insulating oil enclosing part in which said stator is confined, a pair of brackets connected to the pair of said end plates respectiely and a rotor placed in said can to be journaled by said brackets, a lubricating oil enclosing part being defined by said can, brackets and rotor, and a flexible pressure adjusting means placed in said insulating oil enclosing part to sealingly divide the interior of said insulating oil enclosing part into first and second chambers,

wherein said flexible pressure adjusting means comprises a casing, and a sealed flexible member received in said casing to define the interior thereof as said second chamber communicated with a region exterior to said insulating oil enclosing part.

4,558,248

TEMPERATURE-COMPENSATED QUARTZ OSCILLATOR

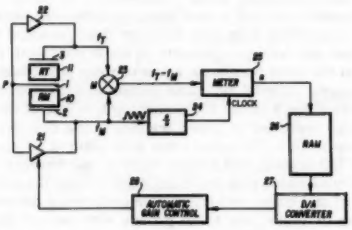
Jean P. Valentin, Pouilley-les-Vignes, France, assignor to Etat Francais, Paris Armees, France

Filed May 2, 1984, Ser. No. 606,248

Claims priority, application France, May 3, 1983, 83 07308

Int. Cl.⁴ H01L *41/08*

U.S. Cl. 310—315 **12 Claims**



1. A temperature compensated quartz oscillator, comprising:

first and second plates of dielectric material arranged face to face and separated from each other, with first and second electrodes on the inner sides respectively of each of said first and second plates;

a piezoelectric wafer of quartz having an active vibration portion located between, and spaced from, said first and second electrodes, said quartz wafer having been cut according to a crystallographic section which has a low temperature sensitivity, said wafer and first and second electrodes comprising a first quartz resonator; and

means for applying to said first and second electrodes excitation electric power to drive active portion of the wafer according to an operative mode thereof having a reference frequency f_M,

wherein the first dielectric plate comprises a quartz crystal cut according to a crystallographic section which has a temperature sensitivity which exceeds the sensitivity of the quartz piezoelectric wafer, and said first dielectric plate cooperates with said first electrode and a third electrode located on the outer surface of the first plate to form a second quartz resonator, and

means for applying to said first and third electrodes electric excitation power to drive the active portion of the first dielectric plate according to a temperature-sensitive mode having a frequency f_T close to, but slightly different from, the reference frequency f_M,

means for comparing signals at terminals of the second and third electrodes,

and means for regulating the means for applying an electric excitation power to drive the active portion of the piezoelectric wafer of the first resonator based on the comparison of signals at the terminals of the second and third electrodes.

4,558,249
STRETCHED PIEZOPOLYMER TRANSDUCER WITH UNSUPPORTED AREAS

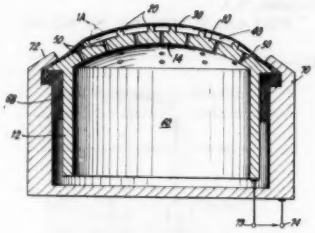
Reinhard Lerch, Hochstrasse 6, D-6420 Lauterbach, and Gerhard M. Sessler, Fichtestrasse 30 B, 6100 Darmstadt, both of Fed. Rep. of Germany

Continuation of Ser. No. 241,428, Mar. 6, 1981, abandoned. This application Mar. 12, 1984, Ser. No. 587,840

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1980, 3009068

Int. Cl.⁴ H01L *41/08*

U.S. Cl. 310—322 **20 Claims**



1. A transducer, comprising:

a piezoelectric membrane including a laminar sheet composed of a piezoelectric material and a pair of conductive electrodes coating the sheet and sandwiching the sheet between them;

said membrane have two surfaces, an edge portion, and a central portion;

support means for supporting said membrane and electrically contacting said membrane at the electrodes;

said support means including a frame for holding the membrane at the edge portion;

said supporting means including a holding structure contacting the membrane at the center portion;

said holding structure contacting said membrane over a first area of the central portion and leaving a larger second area of the central portion of the membrane unsupported;

said holding structure being rigid, and

said frame having means for stretching the membrane over the rigid holding structure so as to give the unsupported portion a curved shape.

4,558,250
CATHODE STRUCTURE OF ELECTRON TUBE

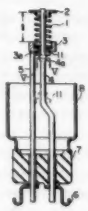
Mamoru Tsuzurabara, Mobara, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 18, 1980, Ser. No. 188,507

Claims priority, application Japan, Oct. 19, 1979, 54-143873[U]; Nov. 21, 1979, 54-150069; Apr. 23, 1980, 55-52972

Int. Cl.⁴ H01J *1/20*

U.S. Cl. 313—337 **8 Claims**



1. A cathode structure for an electron tube comprising

a center lead;

a side lead extending substantially parallel with said center lead;

an upper end shield fixed at an end of said center lead;

a lower end shield having a first aperture and fixed to an end of said side lead, said center lead extending through said first aperture;

a filament fixed to and electrically connected to said upper end shield and said lower end shield;

a spacer made of heat resistive and insulating material disposed in said first aperture between said center lead and said lower end shield; and

a support member for supporting said spacer;

wherein said spacer has an aperture through which said center lead extends, a projection adapted to be fitted to said first aperture and a flange adapted to be abutted against one surface of said lower end shield.

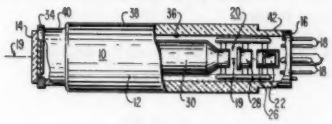
4,558,251
IMAGE PICKUP ASSEMBLY

Louis D. Miller, Leola, Pa., assignor to RCA Corporation, Princeton, N.J.

Filed Sep. 30, 1980, Ser. No. 192,361

Int. Cl.⁴ H01J *31/00*

U.S. Cl. 313—365 **2 Claims**



1. In a pickup tube of the type including an evacuated tubular envelope having a precisely formed inside surface of a substantially constant inside diameter extending along the length of said envelope, the midpoint of said inside diameter lying on a longitudinally extending first mechanical axis, said envelope being closed at one end by a faceplate and at the other end by a stem section, target means within said envelope adjacent to said faceplate, and electron generating means adjacent to said stem section for generating and directing an electron beam along said first mechanical axis of said tube towards said target means, the improvement wherein said envelope comprises

an insulating member with a precisely formed outside surface having a substantially constant outside diameter, said precisely formed outside surface extending along substantially the entire length of said envelope, said outside envelope surface and said inside envelope surface being substantially coaxial to a tolerance of at least 0.0254 mm, the midpoint of said outside diameter lying on a longitudinally extending second mechanical axis which is substantially coincident with said first mechanical axis.

4,558,252
COLOR CATHODE RAY TUBE WITH FRAME, MASK OR SHIELD HAVING AN OXIDIZED LAYER

Masaharu Kanto; Hisato Kihara, both of Hyogo; Koichi Teshima, Tokyo, and Michihiko Inaba, Kawasaki, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Filed Nov. 3, 1982, Ser. No. 438,721

Claims priority, application Japan, Nov. 9, 1981, 56-178371

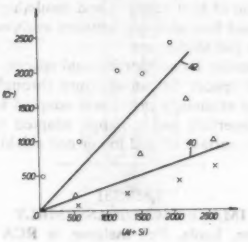
Int. Cl.⁴ H01J *29/07, 29/81*

U.S. Cl. 313—402 **3 Claims**

1. A color cathode ray tube comprising:

an envelope having a face plate, a funnel portion joined to said face plate and a neck portion joined to said funnel portion;

an electron gun disposed within said neck portion;
a phosphor screen formed on said inner surface of said face plate;
a mask frame mounted to said face plate;
a shadow mask attached to said mask frame, said shadow mask having a plurality of apertures therein and which faces said phosphor screen; and
an inner shield attached to said mask frame;



wherein at least one part of said mask frame, said shadow mask and said inner shield is made substantially of iron and has an oxidized layer on a surface thereof, said iron part further including silicon, aluminum and chromium as impurity elements in weight amounts satisfying the following relation:

$Cr \geqq \frac{1}{4}(Al+Si)$

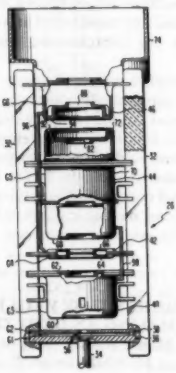
wherein $Cr+Al+Si \leqq 0.44$ percent by weight, to enhance the adhesion of the oxidized layer.

4,558,253

COLOR PICTURE TUBE HAVING AN INLINE ELECTRON GUN WITH ASYMMETRIC FOCUSING LENS

Dennis J. Bechis, Lawrenceville, N.J.; Hsing-Yao Chen, Landisville, and Richard H. Hughes, Lancaster, both of Pa., assignors to RCA Corporation, Princeton, N.J.

Filed Apr. 18, 1983, Ser. No. 485,860
Int. Cl.[4] H01J *29/62*
U.S. Cl. 313—414 **9 Claims**



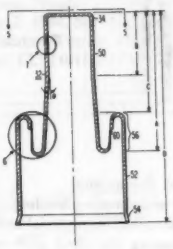
5. An electron gun for generating at least one electron beam, comprising
an asymmetric beam-forming region including a cathode and at least two electrodes each having at least one aperture therein, at least one of the beam-forming region electrodes including a slot superposed on an aperture therein for forming an asymmetric field,
a two electrode asymmetric main focusing lens, the asymmetry of said main focusing lens being matched to the asymmetry of said beam-forming region to focus substantially all portions of the electron beam at a common position relative to said electron gun, and
a three electrode prefocus lens located between said beam-forming region and said main focus lens wherein an electrode of said main focusing lens and said prefocus lens are common.

4,558,254

CATHODE-RAY TUBE HAVING AN IMPROVED LOW POWER CATHODE ASSEMBLY

Stephen T. Opresko, Lancaster, Pa., assignor to RCA Corporation, Princeton, N.J.

Filed Apr. 30, 1984, Ser. No. 605,243
Int. Cl.[4] H01J *29/46*
U.S. Cl. 313—446 **5 Claims**



5. In an electron gun including a cathode assembly comprising
a cathode sleeve having oppositely disposed ends, said cathode sleeve being open at one end and closed at the other end, said closed end including a cap having an electron emitting coating thereon,
a heater filament disposed within said sleeve, said heater filament having a heater body portion with a pair of heater legs extending therefrom, said heater legs being attached to a pair of heater straps, and
a cathode eyelet disposed around at least a portion of said cathode sleeve and attached thereto, the improvement wherein
said cathode sleeve comprising a laminated bimetal member having a first layer of material and a second layer of material overlying less than all of said first layer, said second layer having a thermal conductivity higher than that of said first layer, said sleeve including a generally longitudinally extending first portion having a first diameter conforming closely to said heater body portion of said heater filament for reducing the power requirement thereof, and a second generally longitudinally extending portion having a diameter greater than said first diameter, said first portion including said closed end and said cap, said cap being formed of said second layer of material having the higher thermal conductivity, said second portion having a segment which coaxially encompasses a section of said first portion of said sleeve below said cap, said segment of said second portion being connected to said section of said first portion by a reverse drawn transition region, said transition region providing an effectively extended thermal length, greater than the overall length of said sleeve, said second portion, said section of said first portion and said transition region being formed of said first layer of material to minimize heat conduction along said sleeve, said transition region having a plurality of slots formed therein, and
said heater legs terminating within said second portion of said cathode sleeve having said greater diameter, whereby said pair of heater straps may be accommodated in said

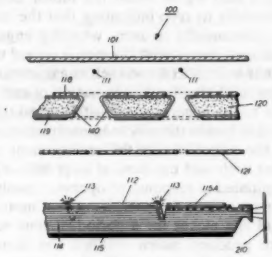
greater diameter second portion to minimize thermal losses from said heater legs.

4,558,255

EDGE-OUT MATRIX LIGHT BAR COUPLING APPARATUS AND METHOD USING A FIBER-OPTICS PLATE

Frank C. Genovese, Fairport, and Joel M. Pollack, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed May 1, 1984, Ser. No. 605,730
Int. Cl.[4] H01J *1/62, 63/04*
U.S. Cl. 313—497 **19 Claims**



1. A vacuum fluorescent printing device adapted for use in conjunction with a light sensitive recording media in order to create in imagewise configuration electronically generated data, comprising in combination:

a plurality of cathode filaments;

a control grid;

a matrix of addressable areas on an anode covered with phosphor such that as said phosphor areas are excited by electrons from said cathode filaments through said control grid a high resolution array of precisely defined light is generated and directed toward said light sensitive recording media; and

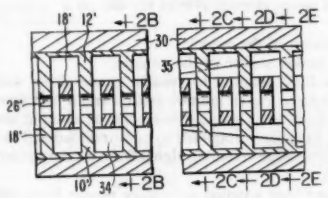
a fiber-optics plate adapted to support said phosphor coated anode and transmit the light from said phosphor areas to said light sensitive recording media in a linear array.

4,558,256

VELOCITY TAPERING OF COMB-QUAD TRAVELING-WAVE TUBES

Arthur Karp, Palo Alto, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Jun. 9, 1983, Ser. No. 502,432
Int. Cl.[4] H01J *25/34*
U.S. Cl. 315—3.5 **4 Claims**



1. A slow-wave circuit for a traveling-wave tube comprising:

a hollow conductive envelope extending around and along an axis;

two sets of equally spaced parallel identical rungs extending across said envelope, in angular separation, said rungs of a first set interleaving through the spaces between rungs of a second set;

an axial passageway through said rungs for a linear electron beam;

axially continuous openings bounded by the bases of rungs of said two sets and intervening walls of said envelope;

each of said sets of rungs comprising a pair of coplanar combs, each comb formed of a single piece of metal, each comb comprising an axial back member affixed to the inside of said envelope and an array of teeth extending toward said axis, the teeth of said combs of said set being axially aligned;

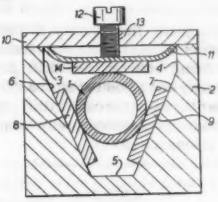
the cross section of at least one of said axially continuous openings being increased toward the output end of said circuit.

4,558,257

TRAVELLING WAVE TUBE ARRANGEMENTS

Cyril T. Ball, Marks Tey; Peter Tourle, Chelmsford, and Robert L. Wright, Coggeshall, all of England, assignors to English Electric Valve Company, Limited, Chelmsford, England

Filed Dec. 23, 1983, Ser. No. 565,257
Int. Cl.[4] H01J *23/02*
U.S. Cl. 315—5.38 **11 Claims**



1. A travelling wave tube arrangement in which a collector electrode of the travelling wave tube is cradled between two inclined surfaces of cradling means of an electrically insulating material of good thermal conductivity and a pressure member also of electrically insulating material of good thermal conductivity is provided to exert pressure upon said collector in order to press the same between said inclined surfaces and said pressure member, said cradling means and said pressure member being supported by a body which is itself of a good heat conducting material.

4,558,258

KLYSTRON UNIT

Setsuo Miyake, Fujisawa, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Apr. 25, 1983, Ser. No. 488,609
Claims priority, application Japan, Apr. 26, 1982, 57-68592
Int. Cl.[4] H01J *25/10*
U.S. Cl. 315—5.39 **21 Claims**

1. A klystron unit comprising:

electron gun means for generating an electron beam along a beam path;

collector means for collecting said electron beam;

input resonator means located along said beam path in the vicinity of said gun, for defining an input resonance cavity and velocity-modulating said electron beam in response to an input signal;

output resonator means for defining an output resonance cavity located along said beam path in the vicinity of said collector means, from which an output signal is picked up;

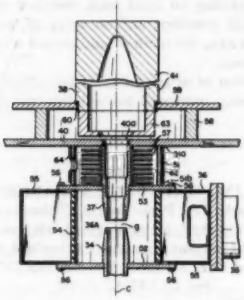
at least one intermediate resonator means disposed along said electron beam path between said input and output resonator means, for defining at least one intermediate resonance cavity for velocity-modulating said electron beam;

drift tubes disposed along said electron beam path, for cou-

pling said resonators to each other and defining a drift gap in each resonance cavity;

means for generating a magnetic flux along said electron beam path to focus said electron beam; and

means for providing magnetic flux density distribution along said electron beam path to cause a maximum point of said distribution to fall within a predetermined area, and to



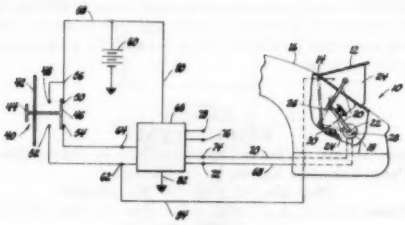
cause said magnetic flux density to decrease from said maximum point to said collector means, said predetermined area being between said drift gap in said output resonance cavity and a point at most 3/5ths of the distance from said output resonance cavity drift gap to the drift gap of an intermediate resonance cavity which is adjacent to said output resonance cavity.

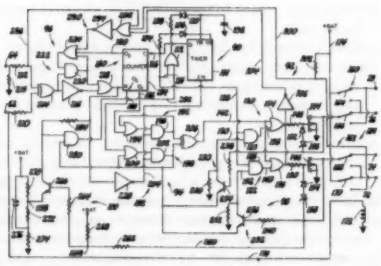
4,558,259

CONTROLLER FOR A MOVABLE MOTOR VEHICLE HEADLAMP MECHANISM

Gale M. Craig, Anderson, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 9, 1984, Ser. No. 569,221
Int. Cl.[4] B60Q *1/02*
U.S. Cl. 315—82 **10 Claims**





1. In a motor vehicle lighting system including a headlamp, an operator manipulated headlamp switch, movable concealment means, a source of direct voltage, and an electric motor connected to said concealment means and adapted to be energized with said source for moving the concealment means into engagement with a mechanical stop to fully expose the headlamp, the improvement comprising:

oscillator means for generating a series of pulses in response to operator manipulation of headlamp switch;

run means operative to energize said motor with said source in accordance with the pulses generated by said oscillator means for moving the concealment means toward the mechanical stop;

voltage responsive means for sensing a motor counter-EMF related voltage as an indication of motor rotation and for generating a stall signal when the motor counter-EMF falls substantially to zero indicating that the motor speed has fallen substantially to zero, whereby engagement of the concealment means with the stop is sensed without the use of a limit switch to sense such engagement;

stop means for inhibiting further operation of said run means in response to the generation of a stall signal by said voltage responsive means thereby to interrupt motor energization after the motor moves the concealment means into engagement with said mechanical stop; and

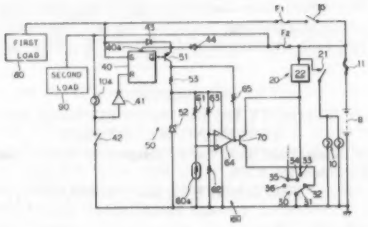
start means initiated in response to operator manipulation of said headlamp switch for energizing said motor independent of said run means for a period of time sufficient in duration to produce motor rotation for increasing the motor counter-EMF substantially above zero, whereafter motor energization is controlled by said run means, said voltage responsive means and said stop means.

4,558,260

HEAD LAMPS CONTROL SYSTEM FOR USE ON VEHICLES

Mitsuhiko Masegi, Nukata, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed May 3, 1984, Ser. No. 606,686
Claims priority, application Japan, May 4, 1983, 58-78648
Int. Cl.[4] B60Q *1/02*
U.S. Cl. 315—82 **4 Claims**



1. A head lamps control system for use on a vehicle, comprising:

(a) head lamps of the vehicle;

(b) a DC power source of the vehicle;

(c) a first load adapted to receive power from said DC power source via an ignition switch and a first fuse;

(d) a flip flop circuit adapted to receive at an input terminal thereof a supply voltage fed to said first load and produce a supply voltage retaining signal from an output terminal thereof;

(e) a second load adapted to receive power from said DC power source via a second fuse;

(f) A first diode with anode connected to the input terminal of said flip flop circuit;

(g) a second diode with anode connected to a power supply line between said second fuse and said second load and with cathode connected to the cathode of said first diode;

(h) an auxiliary power supply means adapted to operate upon receipt at a control terminal thereof the supply

voltage retaining signal from said flip flop circuit, receive at an input terminal thereof the supply voltage from said DC power source via the cathode of said first and second diodes and output this supply voltage;

(i) a detector means for detecting a quantity of light around the vehicle and producing a detected signal;

(j) an output signal generating means adapted to operate upon receipt of the supply voltage from said auxiliary power supply means and generate an output signal upon judging that the outside of the vehicle is dark on the basis of the detected signal provided from said detector means; and

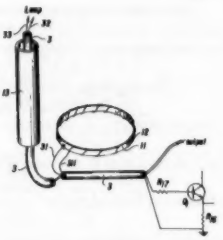
(k) a drive means for turning on the head lamps in response to the output signal from the output signal generating means.

4,558,261

EXCLUSIVE PLUG FOR ARTISTIC TABLE LAMPS

Hsiang T. Cheng, 2F, No. 185, Nan Ya W Rd., Sec. 2, Pan Chiao City, Taipei Hsien, Taiwan

Filed Feb. 14, 1984, Ser. No. 579,934
Int. Cl.⁴ H05B *37/02*
U.S. Cl. 315—209 R **1 Claim**



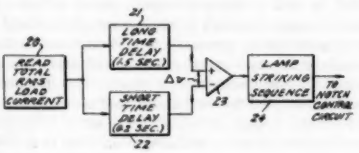
1. A power plug for use with artistic table lamps, comprising a plug means, plug body, power indicator light, operational circuit, base plate and cable means, wherein the cable means includes a three core line having one input signal line and two output voltage lines, demagnetizing wires being respectively provided on the outside of the input signal line and around said three core line, and said operational circuit is installed in said plug body.

4,558,262

LOAD SWITCHING ARRANGEMENT FOR GAS DISCHARGE LAMP CIRCUIT

John E. Longenderfer, Orefield; David G. Luchaco, Macungie, and Dennis Capewell, Easton, all of Pa., assignors to Lutron Electronics Co., Inc., Coopersburg, Pa.

Filed Mar. 9, 1983, Ser. No. 473,800
Int. Cl.⁴ H05B *41/38*
U.S. Cl. 315—307 **14 Claims**


READ TOTAL RMS LOAD CURRENT
LONG TIME DELAY (1.5 SEC.)
SHORT TIME DELAY (0.3 SEC.)
LAMP STRIKING SEQUENCE
TO NOTH CONTROL CIRCUIT

1. A gas discharge lamp lighting system comprising:

a main power source;

at least one gas discharge lamp and ballast combination;

a control circuit connected between said main power source and said lamp and ballast combination and regulating the power applied to said lamp and ballast combination from said main power source;

switch means connecting said control circuit and said lamp and ballast combination;

first circuit means connected to said switch means for detecting when said switch means is activated to cause power from said control circuit to be applied to said lamp and ballast combination, said first circuit means comprising load current measuring means for measuring and producing an output indicative of the load current through said lamp and ballast combination, a long time delay circuit responsive to said output of said measuring means for producing a sampling signal output having a waveform which is proportional to but delayed with respect to said output of said measuring means, a short time delay circuit responsive to said output of said measuring means for producing an output having a waveform which is delayed with respect to and proportional to said output of said measuring means and which suppresses line-transient variations associated with said output of said measuring means, a comparator circuit having first and second inputs connected to said outputs of said long time delay circuit and said short time delay circuit, respectively, and having an output which switches whenever said short time delay circuit output reaches a given value relative to said long time delay output;

second circuit means connected to said first circuit means and activated by the switching of said output of said comparator for activating said control circuit to, increase its output from an initial value to a full rated output in a smooth and continuous manner in a first predetermined time period,

remain at full rated output for a second predetermined time period which begins immediately upon completion of said first predetermined time period,

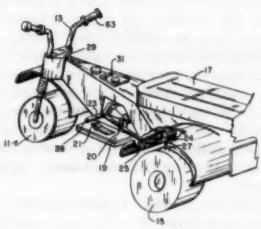
and reduce its output from full rated output to said initial value in a smooth and continuous manner in a third predetermined time period which begins immediately upon completion of said second predetermined time period.

4,558,263

ALL TERRAIN VEHICLE TOY WITH DYNAMIC BRAKING

Timothy S. Harris, and Lawrence R. Harrod, both of Fort Wayne, Ind., assignors to Pines of America, Inc., Ind.

Filed Dec. 6, 1983, Ser. No. 558,757
Int. Cl.⁴ H02P *1//16*
U.S. Cl. 318—139 **23 Claims**



16. A wheeled riding toy for a child comprising:

direct current motor means gear reduction coupled in driving relation to respective toy wheels;

storage battery means;

first means for connecting the storage battery means to the direct current motor means for toy operation, said first means including a hand grip controllable switch;

and second means for disconnecting the motor means from the battery means and connecting the motor means to a resistive load for dynamic braking of the toy, said second

means including a run-brake switch normally biased to connect the battery means to the motor means and a foot depressible pivotally mounted lever arrangement readily accessible to a child's foot to be depressed actuating the run-brake switch from its normal position to dynamically brake the toy.

20. A wheeled riding toy for a child comprising:

direct current motor means gear reduction coupled in driving relation to respective toy wheels;

storage battery means;

first means for connecting the storage battery means to the direct current motor means for toy operation; and

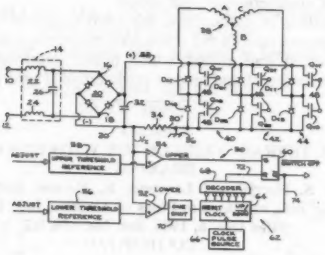
second means for disconnecting the motor means from the battery means and connecting the motor means to a resistive load for dynamic braking of the toy, the second means including lever arrangement pivotally mounted for limited rotation about an axis extending generally transversely of the toy with an end portion extending forwardly from the pivot axis, said end portion including a transverse toe portion accessible for depression by a child, and said lever arrangement further having an arm portion extending rearwardly from the pivot axis and then transversely generally parallel to the pivot axis to engage said second means.

4,558,264

CURRENT CONTROL METHOD AND CIRCUIT FOR ELECTRONICALLY-COMMUTATED MOTORS

Richard C. Weischedel, deceased, late of Camillus, N.Y. by Anne S. Weischedel, executor, assignor to General Electric Company, Louisville, Ky.

Filed Oct. 18, 1984, Ser. No. 662,347
Int. Cl.[4] H02P *6/02*
U.S. Cl. 318—254 **12 Claims**



5. A control circuit for maintaining a desired average current through the windings of an electronically-commutated motor supplied from an electric power source and of the type including a plurality of windings selectively energized and de-energized from the source; said circuit comprising:

at least one switching element for controllably energizing at least one of the windings from the power source;

a plurality of free-wheeling diodes connected to the windings for providing paths for current driven by flyback voltage induced by collapsing magnetic fields upon winding de-energization;

lower threshold comparison means responsive to the magnitude of current supplied from the source to the motor windings for providing a signal when current is at or above a lower threshold current level;

upper threshold comparison means responsive to the magnitude of current supplied from the source to the motor windings for providing a signal to said switching element for de-energizing said at least one winding when current is at or above an upper threshold current level;

a timer of the type which measures an input time interval and provides an output time interval as a function of the input time interval;

connections between said comparison means and said timer for measuring, as the input time interval, the ON time required for current to increase from the lower threshold current level to the upper threshold current level; and

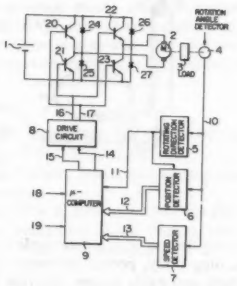
a connection between said timer and said switching element for establishing an OFF time interval during the timer output time interval.

4,558,265

METHOD AND APPARATUS FOR POSITION CONTROL OF AN ELECTRIC MOTOR

Hiroshi Hayashida, Mito; Tadashi Takahashi, and Kunio Miyashita, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 2, 1983, Ser. No. 471,434
Claims priority, application Japan, Mar. 3, 1982, 57-32363
Int. Cl.[4] G05B *13/00*
U.S. Cl. 318—561 **6 Claims**



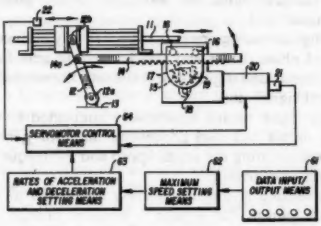
1. A method of controlling a position of an electric motor with the aid of a rotation angle detector for detecting a rotation angle of a rotating shaft of said motor or a rotating shaft constituting a part of a power transmission path for operatively coupling said rotating shaft of said motor to an apparatus constituting a load, said rotation angle detector providing signals representative of the rotation angle and a rotating speed of said rotating shaft, and a control circuit for controlling said motor so that said motor is positioned at a given position in accordance with a position command signal issued to said motor in consideration of said rotation angle and said rotating speed,

wherein a control process activated upon starting of said motor in response to said position command signal and ending upon stoppage of said motor at a position designated by said position command signal includes a first control region in which at least acceleration of said motor in an accelerating phase thereof is detected and subsequently a constant speed operation of said motor is effected at a maximum speed, a deceleration initiating time point determined on the basis of said acceleration, a second control region in which said motor is decelerated from said deceleration initiating time point in accordance with a deceleration pattern which is determined in dependence on a rotation angle between the deceleration initiating position and the commanded stop position, torque of said motor and magnitude of inertia of said load detected at the time point at which said deceleration is initiated, and a fifth control region in which said motor is held at the stop position designated by said position command signal.

4,558,266
WORKPIECE TRANSFER APPARATUS

Tamotsu Sasaki, Mishima, and Yutaka Tsuchiya, Shizuoka, both of Japan, assignors to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 15, 1984, Ser. No. 590,050
Claims priority, application Japan, Mar. 22, 1983, 58-45918
Int. Cl.[4] G05B *19/25*
U.S. Cl. 318—571 **5 Claims**


SERVOMOTOR CONTROL MEANS
RATES OF ACCELERATION AND DECELERATION SETTING MEANS
MAXIMUN SPEED SETTING MEANS
DATA INPUT/ OUTPUT MEANS

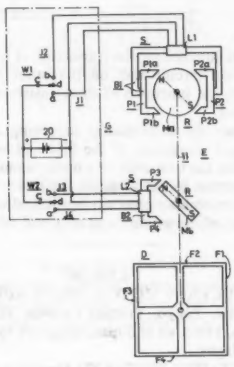
1. Workpiece transfer apparatus comprising:
a reciprocating transfer bar for transferring a workpiece;
a swinging lever connected to said transfer bar for reciprocating the same;
a rack connected to said swinging lever;
a pinion meshing with said rack;
an eccentric arm driven by a servomotor for driving said pinion;
means for measuring a stroke of said transfer bar for producing stroke data;
means for detecting an origin of said transfer bar; and
a computer including:
means for setting a maximum speed of said servomotor in accordance with a weight of said workpiece and said stroke data;
means for setting rates of acceleration and deceleration of said servomotor in accordance with said maximum speed; and
means for supplying a start signal to said servomotor in accordance with an origin confirmation signal produced by said origin detecting means.

4,558,267
ROTATING DISPLAY ELEMENT AND DISPLAY UNIT USING THE SAME

Yoshimasa Wakatake, No. 405, 9-5 Tamagawa 1-chome, Setagaya-Ku, Tokyo, Japan

Filed Apr. 28, 1983, Ser. No. 489,550
Claims priority, application Japan, Apr. 30, 1982, 57-74009
Int. Cl.[4] G05B *19/40*
U.S. Cl. 318—696 **2 Claims**

1. A rotating display element comprising:
a display surface structure (D) having sequentially disposed four display surface (F1 to F4); and
a permanent magnet type stepping motor mechanism (Q);
wherein the display surface structure (D) is mounted on a rotor of the permanent magnet type stepping motor mechanism (Q) in a manner to incorporate therein the permanent magnet type stepping motor mechanism (Q);
wherein the four display surfaces (F1 to F4) of the display surface structure (D) are disposed at 90 intervals around the axis of the rotor;
wherein either one of the rotor and the stator of the permanent magnet type stepping motor mechanism (Q) is provided with a double-pole permanent magnet member (M) having first and second double-pole permanent magnets (Ma and Mb) disposed side by side in the lengthwise direction of the axis of rotor, the first and second double-pole permanent magnets (Ma and Mb) each having north and south magnetic poles spaced apart a 180° angular distance around the axis of the rotor; and
wherein the other of the rotor and the stator of the permanent magnet type stepping motor mechanism (Q) is provided with a first magnetic member (**B1**) having first and second magnetic poles (**P1** and **P2**) acting on the north and south magnetic poles of the first double-pole permanent magnet (Ma), a second magnetic member (**B2**) having third and fourth magnetic poles (**P3** and **P4**) acting on the north and south magnetic poles of the second double-pole permanent magnet (Mb), a first exciting winding (**L1**) wound on the first magnetic member (**B1**) in manner to excite the first and second magnetic poles (**P1** and **P2**) in reverse polarities, and a second exciting winding (**L2**)



wound on the second magnetic member (**B2**) in a manner to excite third and fourth magnetic poles (**P3** and **P4**) in reverse polarities, the first and second magnetic poles (**P1** and **P2**) of the first magnetic member (**B1**) being disposed at 180° intervals around the axis of the rotor, the third and fourth magnetic poles (**P3** and **P4**) of the second magnetic member (**B2**) being disposed at 90° intervals around the axis of the rotor, the first magnetic pole (**P1**) of the first magnetic member (**B1**) comprising first and second magnetic pole portions (**P1***a* and **P1***b*) disposed at 90° intervals around the axis of the rotor, and the second magnetic pole (**P2**) of the first magnetic member (**B1**) comprising third and fourth magnetic pole portions (**P2***a* and **P2***b*) disposed at 90° intervals around the axis of the rotor.

4,558,268
CONTROL DEVICE FOR TWO BIDIRECTIONAL STEP MOTORS

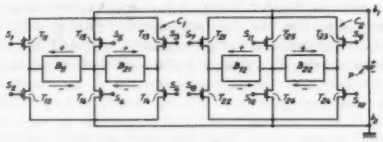
René Besson, Neuchatel, Switzerland, and Yves Guérin, St-Louis, France, assignors to ETA S.A., Fabriques d'Ebauches, Granges, Switzerland

Filed May 18, 1984, Ser. No. 611,770
Claims priority, application Switzerland, Jun. 29, 1983, 3548/83
Int. Cl.[4] H02K *29/04*
U.S. Cl. 318—696 **2 Claims**

1. A control device for two bidirectional step motors, each with a first and second coil, which includes:
two supply terminals (b_1, b_2) adapted for connection to terminals of an electric energy source;
a first driving circuit (C_1) which includes three circuit branches that are parallel connected between said supply terminals, each circuit branch including two series transistors (T_{11}–T_{16}) which can be controlled to apply current pulses of controlled polarity to the first coils (B_{11}, B_{21}) of the step motors, said first coils being connected, on the one hand, both connected to the junction of the transistors of one

of the branches and, on the other hand, respectively connected to the junctions of the transistors of the two other branches;

a second driving circuit (C_2) which also includes three branches that are parallel connected between said supply terminals, each circuit branch including two series transistors (T_{21}–T_{26}) that can be controlled to apply current impulses of controlled polarity to the second coils (B_{12}, B_{22}) of the step motors, said second coils being, on the one hand, both con-



nected to the junction of the transistors of one of the branches of that second circuit and, on the other hand, respectively connected to the junctions of the transistors of the two other branches; and

control means for individually supplying control signals to each of said transistors of the first and second driving circuits so that the two coils of a motor simultaneously receive needed current pulses to make the motor turn and so as to prevent the simultaneous application of current pulses to a coil of one of the motors and to a coil of the other.

4,558,269

INDUCTION MOTOR DRIVE APPARATUS

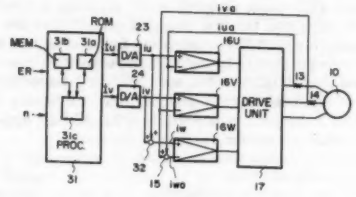
Hiroshi Ishida, Tokyo; Yoshiki Fujioka, Higashiyamoto, and Naoto Ota, Hino, all of Japan, assignors to Fanuc Ltd, Minamitsuru, Japan

PCT No. PCT/JP82/00137, § 371 Date Dec. 14, 1982, § 102(e) Date Dec. 14, 1982, PCT Pub. No. WO 83/0392, PCT Pub. Date Nov. 10, 1983

PCT Filed Apr. 22, 1982, Ser. No. 453,895

Int. Cl.⁴ H02P *5/34*

U.S. Cl. 318—811 **3 Claims**



1. An induction motor drive apparatus which produces three-phase current commands from a speed error signal in accordance with a speed error between a speed command and an actual speed and controls a drive unit for driving an induction motor on the basis of the three-phase current commands, comprising:

angle means, operatively connected to the induction motor, for finding an angle of rotation of the induction motor (angle θ);

sinusoidal signal generating means, operatively connected to said angle means and to receive the speed error signal and the actual speed, for generating, through digital processing, first and second phase sinusoidal signals, comprising:

a memory for storing a relation between the angle θ and sin θ, a torque-amplitude characteristic, a torque-phase difference characteristic and a rotational speed-slip characteristic;

a processing unit, operatively connected to said angle means and said memory, for obtaining a first digital sine wave sin θ corresponding to the first phase sinusoidal signal, and for shifting the phase of the first digital sine wave by $2\pi/3$ to generate a second digital sine wave corresponding to the second phase sinusoidal signal;

third phase means, operatively connected to the drive unit and said sinusoidal signal generating means, for generating a third phase sinusoidal signal, using the first and second phase sinusoidal signals where the first, second and third phase sinusoidal signals have a sum equal to zero;

a first digital/analog converter, operatively connected to said third phase means and said processing unit, for converting the first digital sine wave into the first phase sinusoidal signal; and

a second digital/analog converter, operatively connected to said third phase means and said processing unit, for converting the second digital sine wave into the second phase sinusoidal signal; and

speed error signal means, operatively connected to the induction motor and said processing unit, for generating signals representing the actual speed and the torque of the drive unit, comprising:

position sensing means, operatively connected to the induction motor, for sensing a position change of the induction motor;

error detecting means, operatively connected to said position sensing means and to receive the speed command, for generating the speed error signal;

torque detecting means, operatively connected to said error detecting means, said angle means and said processing unit, for detecting a torque generated by the induction motor; and

speed detecting means, operatively connected to said position sensing means and said processing unit, for detecting the actual speed of the induction motor.

4,558,270

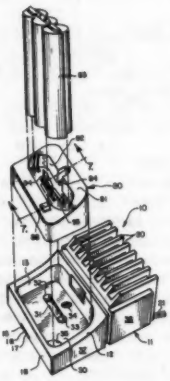
BATTERY CHARGING ADAPTER FOR A BATTERY CHARGER FOR A PORTABLE BATTERY OPERATED TRANSCEIVER

James P. Liautaud, River and Bluff Rds., Trout Valley, Cary, Ill. 60013; Peter F. Stultz, Elgin, Ill.; David L. Maloney, Barrington, Ill., and John K. Westberg, II, Elgin, Ill., assignors to James P. Liautaud, Cary, Ill.

Filed Sep. 6, 1983, Ser. No. 529,859

Int. Cl.⁴ H02J *7/00*; H01M *10/46*

U.S. Cl. 320—2 **20 Claims**



1. A battery charging system for supplying charging current to a battery pack for a battery utilization device, comprising;

a housing having an interior chamber and a device receptacle for receiving the batter utilization device;

circuit means within said housing for producing a battery

charging current having a pressure activated switch for initiating a deep discharge mode, said switch being operator-actuable through an access aperture in the bottom wall of said device receptacle;

contact means extending into said receptacle for establishing electrical communication between said circuit means and said battery utilization device; and

adapter means including a housing adapted for installation in said receptacle and defining an alternative receptacle for receiving said battery pack, and including contact means adapted to establish electrical communication between said device receptacle contacts and said battery pack, said adapter means further including actuator means operator-accesible from the exterior of said adapter housing for actuating said switch.

13. A battery charging system for supplying charging current to a battery pack for a battery utilization device through device contacts on the housing of the utilization device when the battery pack is mounted therein or directly through the terminals of the battery pack when the battery pack is removed from the utilization device, said system comprising;

a housing having an interior chamber and a device receptacle for receiving the battery utilization device;

circuit means within said housing for producing a battery charging current;

device receptacle contact means in said receptacle for establishing electrical communication between said circuit means and said device contacts of said battery utilization device; and,

adapter means including an adapter housing adapted for installation in said receptacle and defining an alternative receptacle for receiving said battery pack and further including adapter contact means extending into said alternative receptacle for establishing electrical communication between said device receptacle contacts and the terminals of said battery pack.

4,558,271

POWER INDUCTIVE COUPLERS

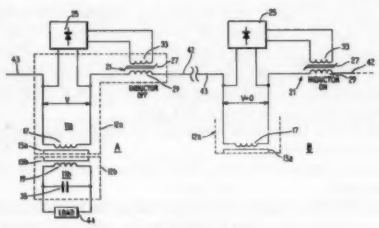
Douglas P. Poole, Bristol, England, assignor to Marconi Avionics Limited, England

Filed Mar. 7, 1984, Ser. No. 587,233

Claims priority, application United Kingdom, Mar. 11, 1983, 8306738

Int. Cl.⁴ G05F *3/06*

U.S. Cl. 323—306 **11 Claims**



1. A separable two-part inductive coupler comprising in one part a primary winding and in the other part a secondary winding, said windings being so disposed within said parts as to be mutually coupled by a common magnetic circuit formed when said parts are operably adjacent, wherein said one part further includes a current limited saturable reactor provided with:

(a) a choke winding connected in series with said primary winding,

(b) control means responsive to the formation of said magnetic circuit, and

(c) a control winding arranged to be energised by said control means in response to the formation of said magnetic circuit so as to saturate said saturable reactor when said parts are operably adjacent and to leave said saturable reactor unsaturated when said parts are separated.

4,558,272

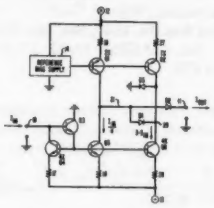
CURRENT CHARACTERISTIC SHAPER

James T. Grosch, Budd Lake, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 5, 1984, Ser. No. 628,042

Int. Cl.⁴ G05F *3/20*

U.S. Cl. 323—315 **9 Claims**



1. A current characteristic shaping circuit comprising

means for combining a fixed current and a first input-signal-variable current to produce a corresponding output current, and

means, responsive to a predetermined level of said output current, for switching a second input-signal-variable current into or out of said output current depending upon the direction of output current transition through said predetermined level.

4,558,273

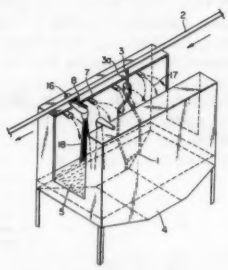
APPARATUS FOR THE INSPECTION OF ELECTRODEPOSITED ELECTRICALLY INSULATING COATINGS

Tsugio Nishimura, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 1, 1983, Ser. No. 500,231

Int. Cl.⁴ G01R *31/12*

U.S. Cl. 324—54 **5 Claims**



1. An apparatus for inspecting electrodeposited electrically insulating coatings comprising;

a tank having an input opening and an output opening;

wetting means for thoroughly wetting with an electrically conducting liquid an electrically conducting part which has been covered with an electrically insulating coating;

means for producing a low pressure, high flow volume liquid column of said conducting liquid;

conveyor means, extending through said tank through said input and output openings, for conveying said electrically

conducting part past said wetting means and through said low pressure liquid column in succession; and

current measuring means for applying a voltage between said electrically conducting part and said liquid column when said part passes through said liquid column and for measuring the resulting current.

4,558,274

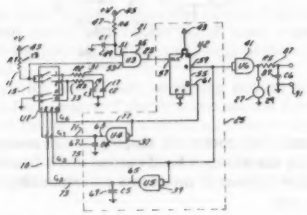
APPARATUS AND METHOD DETERMINING THE VALUE OF A CAPACITANCE

Steven J. Carusillo, Elkhart, Ind., assignor to Johnson Service Company, Milwaukee, Wis.

Filed Sep. 14, 1983, Ser. No. 532,017

Int. Cl.[4] G01R *11/52, 27/26*

U.S. Cl. 324—60 CD **14 Claims**



1. An electrical circuit useful in determining the value of a capacitor including:

a first bilateral switch for flowing a charging current through a resistive element to an initially-depleted first capacitor of known value, thereby charging said first capacitor to the potential of a voltage reference over a resulting first time;

a second bilateral switch for flowing a charging current through said resistive element to an initially depleted second capacitor, thereby charging said second capacitor to said potential over a resulting second time, and;

means for determining said times.

4,558,275

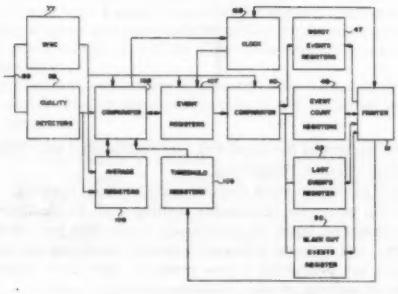
LINE VOLTAGE MONITOR SYSTEM

Dennis M. Borowy, Torrington; Charles A. Crotty, Harwinton; Allen R. Perrins, Branford, and Peter Senak, Jr., Bristol, all of Conn., assignors to The Superior Electric Company, Bristol, Conn.

Filed Apr. 21, 1981, Ser. No. 256,239

Int. Cl.[4] G01R *19/16*

U.S. Cl. 324—103 P **21 Claims**



1. An alternating current line voltage monitor comprising:

(A) a filter adapted for connection to an AC power line for filtering out impulses occurring on a phase thereof;

(B) first means connected to said filter for detecting and storing the peak value of the peak voltage occurring during each half cycle of said phase of said AC power line;

(C) storage means; and

(D) computer means connected to said first means and said storage means for comparing said peak half cycle value with surge and sag thresholds and if it is greater than said surge thresholds or less than said sag threshold, for supplying it, together with the time of occurrence of the first half cycle a threshold was exceeded and

the duration the same threshold was exceeded for consecutive half cycles to said storage means for storage therein.

4,558,276

DEVICE AND METHOD FOR SENSING ELECTRIC CURRENT IN A CONDUCTOR

Leon J. Comeau, 1603 S. 17th St., Grand Forks, N. Dak. 58201, and Roger O. Birkholz, East Grand Forks, Minn., assignors to Leon J. Comeau, Grand Forks, N. Dak.

Filed May 13, 1983, Ser. No. 494,407

Int. Cl.[4] G01R *1/00;* **H01F** *3/04*

U.S. Cl. 324—117 H **14 Claims**

1. A device for sensing electric current through a conductor comprising:

a single open, planar loop of flexible, magnetically conductive material positionable to substantially encircle the conductor and having a first end and a second end which overlap in the plane of the loop, the ends being positioned substantially parallel to and spaced from each other in the area of overlap to form a flux gap;

a Hall Effect transducer positioned in the flux gap between the spaced ends;

mounting means for holding the transducer in position in the flux gap;

means for delivering operating power to the transducer; and

means connected to the transducer for communicating the output of the transducer.

4,558,277

METHOD FOR MEASURING THE NUCLEAR MAGNETIC RESONANCE

Hans Post, Schriesheim; Dieter Ratzel, Rheinstetten, and Peter Brunner, Ettlingen, all of Fed. Rep. of Germany, assignors to Bruker Medizintechnik GmbH, Fed. Rep. of Germany

Filed Mar. 11, 1983, Ser. No. 474,555

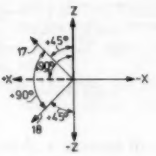
Claims priority, application Fed. Rep. of Germany, Mar. 13, 1982, 3209263

Int. Cl.[4] G01R *33/08*

U.S. Cl. 324—309 **8 Claims**

1. A method for measuring the nuclear magnetic resonance

in a selected volume element of a body, in which the interesting nuclear spins contained in the selected volume element are selectively excited while being subjected to a highly homogeneous stationary magnetic field M_0, characterized by the steps of superimposing upon the homogeneous magnetic field M_0 passing through the entire body a first magnetic field gradient G_Z of identical orientation whose strength varies in a first sense, exciting thereafter all the selected nuclear spins present within the body and in addition, selectively, only the nuclear spins present in a first body plane containing the volume element and extending vertically to the first field gradient G_Z so that the selected nuclear spins contained in this body plane are returned to the sense of the homogeneous magnetic field M_0 while the nuclear spins outside this plane have an orientation differing from the sense of the homogeneous magnetic field M_0, switching off thereafter the first gradient field and superimposing upon the homogeneous magnetic field M_0 a second gradient field G_Y exhibiting in turn an orientation identical to that of the homogeneous magnetic field M_0 and varying in a sense vertical to the first field gradient G_Z, effecting thereafter a second similar excitation of the entirety of the selected nuclear spins contained in the selected body plane and a selective excitation of the selected nuclear spins contained only in a plane containing the volume element and extending perpendicular to the second field gradient, whereafter the nuclear spins contained in a strip defined by the intersection lines of the two planes resume again an orientation identical to that of the homogeneous magnetic field M_0, switching off thereafter the second gradient field G_Y and superimposing upon the homogeneous magnetic field M_0 a third gradient field G_X having the same orientation as the homogeneous magnetic field M_0 and varying in a sense perpendicular to the said first and the said second field gradients, G_Z, G_Y, effecting thereafter a third similar excitation of the entirety of the selected nuclear spins in the strip and a selective excitation of only those nuclear spins which are contained in a third plane containing the volume element and extending perpendicularly to the said strip so that now only the nuclear spins in the selected volume element have the same orientation as the homogeneous magnetic field M_0, and finally switching off the third gradient field G_X and exciting the nuclear spins contained in the volume element by means of one or more pulses to obtain an oscillation generating an induction signal.



4,558,278

NUCLEAR MAGNETIC RESONANCE METHODS AND APPARATUS

Ian R. Young, Sunbury-on-Thames, England, assignor to Picker International, Limited, Wembley, England

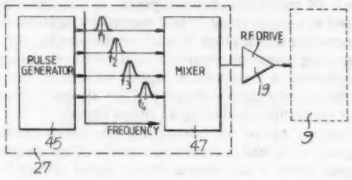
Filed Nov. 29, 1983, Ser. No. 556,010

Claims priority, application United Kingdom, Dec. 17, 1982, 8236043

Int. Cl.⁴ G01R *33/08*

U.S. Cl. 324—309 **4 Claims**

1. A method of obtaining a representation of the spatial distribution in a plurality of substantially parallel slices of a body of a quantity relating to nuclear magnetic resonance including applying a uniform magnetic field to said body; imposing a first gradient on said field in a chosen direction; applying a plurality of r.f. field pulses each within a different discrete frequency band so as to excite nuclear magnetic resonance preferentially in a plurality of spaced parallel planar slices of said body whose planes lie perpendicular to said chosen direction; removing said first gradient, and subsequently applying a second gradient on said field in said chosen direction, the direction of said second gradient being periodically reversed; detecting nuclear magnetic resonance signals occurring while said second gradient is imposed; and processing said signals to derive data relating to each of said plurality of slices.



4,558,279

METHODS FOR DETECTING AND IMAGING A TEMPERATURE OF AN OBJECT BY NUCLEAR MAGNETIC RESONANCE

Jerome L. Ackerman; Leland C. Clark, Jr., and Stephen R. Thomas, all of Cincinnati, Ohio, assignors to University of Cincinnati and Children's Hospital Research Foundation, both of Cincinnati, Ohio

Filed Mar. 7, 1983, Ser. No. 472,675

Int. Cl.⁴ G01R *33/08*

U.S. Cl. 324—315 **54 Claims**

1. A method of determining temperature of an object comprising

subjecting the object comprising a compound to an NMR spectrometer, the compound having at least two forms which are conformational isomers undergoing an exchange process between the conformational isomers which is influenced by temperature,

exposing the compound to temperature to influence the exchange process, and

detecting and processing radio-frequency signals derived from the nuclear magnetic resonance of an element of the compound undergoing the influenced exchange process as a determination of the temperature.

4,558,280

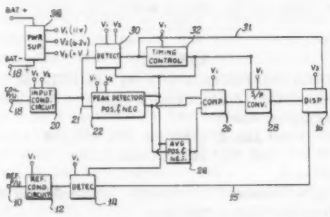
IGNITION SECONDARY ANALYZER

Stephen E. Koehl, Geneva, and Charles R. Tiller, Glenview, both of Ill., assignors to Cooper Industries, Inc., Houston, Tex.

Filed Apr. 1, 1983, Ser. No. 481,391

Int. Cl.⁴ G01R *15/08, 15/04;* **F02P** *17/00*

U.S. Cl. 324—399 **29 Claims**



1. Apparatus for analyzing the secondary ignition circuit of a spark ignited internal combustion engine to identify the location of faulty portions of the circuit, said circuit having

induction coil means for generating sparking voltage pulses repetitively, and distributor means for cyclically distributing said voltage pulses to respective spark plugs in a predetermined order, said apparatus comprising:

measuring means coupled to said secondary ignition circuit for producing measurement signals indicating the amplitude of respective voltage pulses of one polarity developed at a single point in said secondary ignition circuit for respective spark plugs in each engine cycle,

integrating means responsive to said measurement signals for producing a comparison signal indicating the average measurement signals developed for all spark plugs,

offset means for producing an offset signal,

comparator means for comparing successive measurement signals with said comparison signal and producing a fault signal when a said measurement signal differs from said comparison signal by more than said offset signal, and

indicating means responsive to a said fault signal for indicating a fault.

4,558,281

BATTERY STATE OF CHARGE EVALUATOR

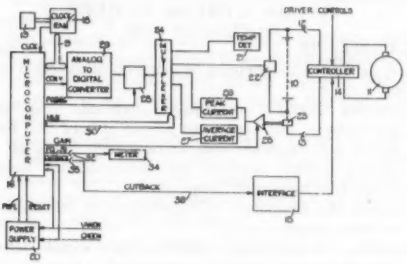
Roger D. Codd, Shirley; Ronald I. Sims, Solihull; Robert B. Olive, Solihull, and Amit S. Jobanputra, Solihull, all of England, assignors to Lucas Industries, Birmingham, England

Filed Jun. 8, 1983, Ser. No. 502,103

Claims priority, application United Kingdom, Jun. 12, 1982, 8217140

Int. Cl.⁴ G01N *27/46*

U.S. Cl. 324—433 **13 Claims**



1. A battery state of charge evaluator comprising a battery, means responsive to the battery for determining a value representing the present maximum charge storage capacity of the battery, means for comparing the present maximum charge storage capacity value with a predetermined value (representing a predetermined percentage of) lower than the nominal maximum charge storage capacity of the battery when new and selecting the lower of said two values, means responsive to the battery current for producing a current value, means for integrating the current value with respect to time to obtain a value representing the charge withdrawn from the battery, and means for determining the state of charge of the battery from said lower value and the charge withdrawn value.

4,558,282

DIGITAL FREQUENCY SYNTHESIZER

Oscar Lowenschuss, Goleta, Calif., assignor to Raytheon Company, Lexington, Mass.

Filed Jan. 3, 1983, Ser. No. 455,399

Int. Cl.⁴ H03K *9/06, 3/78*

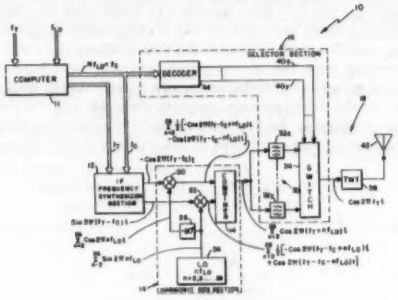
U.S. Cl. 328—14 **4 Claims**

1. A digital frequency synthesizer for producing a signal having a frequency f_T, comprising:

(a) means, responsive to an indication of the frequency f_T and an indication of the fundamental frequency f_{LO} of a predetermined fundamental frequency signal, for determining a frequency equal to the difference between the frequency f_T and a particular harmonic of the fundamental frequency, f_{LO}, where said particular harmonic, Nf_{LO} is selected such that is less than, or equal to, the fundamental frequency f_{LO};

(b) means, responsive to an indication of the frequency f_T and to said particular harmonic Nf_{LO}, for generating an intermediate frequency signal having a frequency equal to said determined frequency $f_T - Nf_{LO}$;

(c) means, responsive to said intermediate frequency signal and a plurality of harmonics of the fundamental frequency signal, for combining the intermediate frequency signal



with said plurality of harmonics of the fundamental frequency signal, to produce a composite signal having a plurality of frequency components separated in frequency one from another by the fundamental frequency, f_{LO}, one of such produced plurality of frequency components having the frequency f_T; and,

(d) means fed by the composite signal and responsive to the harmonic Nf_{LO} for coupling the one of the produced plurality of frequency components of the composite signal having the frequency f_T to an output while rejecting remaining ones of the produced plurality of frequency components of the composite signal.

4,558,283

CIRCUIT FOR GENERATING A SUM OR DIFFERENTIAL FREQUENCY SIGNAL

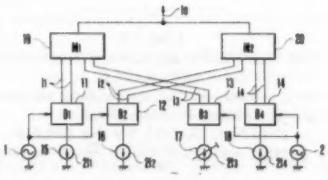
Kazuo Yamagiwa, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Feb. 8, 1984, Ser. No. 578,038

Claims priority, application Japan, Feb. 18, 1983, 58-25814

Int. Cl.⁴ G06G *7/161*

U.S. Cl. 328—160 **10 Claims**



1. A sum or differential frequency signal generating circuit to which input signals of first and second frequencies are supplied and which generates an output signal of the frequency of the sum or difference of said first and second frequencies, said signal generating circuit comprising:

first and second differential amplifiers to which the input signal of said first frequency is supplied and which gener-

ate differential first and second output currents having a phase difference of 90° with each other;

third and fourth differential amplifiers to which the input signal of said second frequency is supplied and which generate differential third and fourth output currents having a phase difference of 90° with each other;

a first multiplier, constituted by a differential amplifier, for generating the multiplication output current of the output currents of said first and third differential amplifiers;

a second multiplier, constituted by a differential amplifier, for generating the multiplication output current of the output currents of said second and fourth differential amplifiers; and

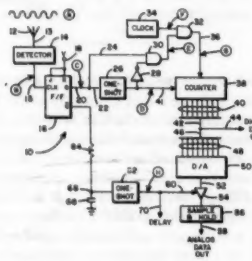
an output terminal at which the output currents of said first and second multipliers are synthesized and fetched.

4,558,284

DIGITAL FREQUENCY-MODULATED DEMODULATION

Gary A. Zaidenweber, St. Paul, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Mar. 12, 1984, Ser. No. 588,838
Int. Cl.⁴ H03D *3/04*
U.S. Cl. 329—126 **2 Claims**



1. An FM demodulator, comprising:

means for receiving a cyclic frequency modulated signal;

signal responsive means coupled to said receiving means for producing a train of signal pulses, said train of signal pulses having a frequency equal to one-half of the frequency of said frequency modulated signal, said signal pulses each having a pulse width equal to one full cycle of said frequency modulated signal;

digital timing means for generating a train of digital timing pulses at a frequency higher than the frequency of said signal pulses;

counter means coupled to said digital timing means for counting said digital timing pulses;

gating means coupled to said digital timing means, to said signal responsive means and to said counter means, for providing a reset signal to said counter means in response to the beginning of one of said signal pulses, for gating through said digital timing following said reset pulse, and in response to the end of said signal pulse for preventing said digital timing pulses from passing through to said counter means; and

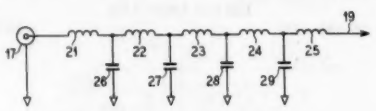
second timing means coupled to said counter and said signal responsive means for generating a read signal in response to the end of said signal pulse, said read signal indicating that said counter means contains a count indicative of the frequency of said frequency modulated signal.

4,558,285

IMPEDANCE-MATCHING DEVICE FOR POWER AMPLIFIER CIRCUIT

Mukunda B. Shrestha, and Geoffrey N. Mendenhall, both of Quincy, Ill., assignors to Broadcast Electronics, Inc., Quincy, Ill.

Filed Apr. 9, 1984, Ser. No. 598,040
Int. Cl.⁴ H03F *3/60;* **H03H** *7/38*
U.S. Cl. 330—53 **9 Claims**



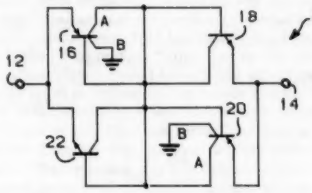
1. A broad-band impedance-matching device for an RF vacuum tube power amplifier comprising a circuit having multiple inductors and capacitors interconnected in an impedance-matching circuit, said circuit incorporating a plurality of series connected inductors extending between a low impedance input and a high impedance output, and a plurality of capacitors each connected between a reference potential and the junction between individual pairs of said inductors.

4,558,286

SYMMETRICAL DIODE CLAMP

Robert A. Neidorff, Chandler, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 26, 1982, Ser. No. 371,876
Int. Cl.⁴ H01L *27/04*
U.S. Cl. 330—252 **19 Claims**



1. A monolithic integrated, symmetrical clamp circuit, comprising:

first and second terminals;

first circuit means coupled between said first and second terminals and the substrate of the integrated diode clamp circuit, said first circuit means being responsive to the voltage level at said first terminal exceeding the voltage level at said second terminal by a predetermined amount for clamping the voltage level thereat and for shunting a majority of the clamping current through the diode clamp circuit to said substrate;

said first circuit means including a first transistor of a first conductivity type having first and second collectors, a base and an emitter, said emitter being coupled to said first terminal, said first collector being coupled to said substrate; and a second transistor of a second conductivity type having a collector, a base and an emitter, said emitter being coupled to said second terminal, said collector and base being interconnected with said base and second collector of said first transistor; and

second circuit means coupled between said first and second terminals and the substrate of the integrated diode clamp circuit, said second circuit means being responsive to the voltage level at said second terminal exceeding the voltage level at said first terminal by a predetermined amount for clamping the voltage level thereat and for shunting a

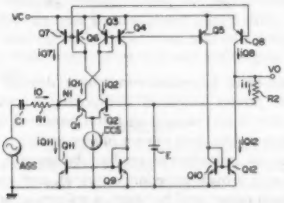
majority of the clamping current through the diode clamp circuit to said substrate.

4,558,287

SIGNAL PROCESSING CIRCUIT

Tatsuo Tanaka, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Japan

Filed Oct. 24, 1984, Ser. No. 664,352
Claims priority, application Japan, Nov. 11, 1983, 58-211886
Int. Cl.⁴ H03F *3/45*
U.S. Cl. 330—257 **16 Claims**



1. A signal processing circuit comprising:

a power supply voltage line, a reference voltage line and a constant voltage terminal;

a signal input terminal and a signal output terminal;

a differential amplifying circuit for generating first and second output signals from first and second output terminals, first and second input terminals of said differential amplifying circuit being respectively coupled to said signal input terminal and constant voltage terminal;

a first current mirror circuit having an input current path coupled between the first output terminal of said differential amplifying circuit and said power supply voltage line, and first and second output current paths which are each coupled at one end to said power supply voltage line;

a second current mirror circuit having an input current path coupled between the second output terminal of said differential amplifying circuit and said power supply voltage line, a first output current path coupled between said signal input terminal and the power supply voltage line, and a second output current path coupled between said signal output terminal and the power supply voltage line;

a third current mirror circuit having an input current path coupled between the other end of the first output current path of said first current mirror circuit and said reference voltage line, and an output current path coupled between said signal input terminal and the reference voltage line; and

a fourth current mirror circuit having an input current path coupled between the other end of the second output current path of said first current mirror circuit and said reference voltage line, and an output current path coupled between said signal output terminal and the reference voltage line.

4,558,288

EMITTER-FOLLOWER TYPE SEPP CIRCUIT

Kazuaki Nakayama, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Apr. 11, 1984, Ser. No. 599,024
Claims priority, application Japan, Apr. 28, 1983, 58-75943
Int. Cl.⁴ H03F *3/26*
U.S. Cl. 330—268 **7 Claims**

1. An emitter-follower type SEPP circuit comprising:

first and second amplifying elements connected in an emitter-follower and class B SEPP arrangement;

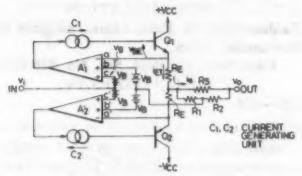
first and second error amplifiers provided respectively for said first and second amplifying elements, each error amplifier having at least three input terminals one noninverting input terminal of which is connected to a circuit input terminal;

first and second current generating means connected respectively between an output of said first error amplifier and an input terminal of said first amplifying element and between an output of said second error amplifier and the input terminal of said second amplifying element for producing a current; and

a resistance network connected between a circuit output terminal and output terminals of said first and second amplifying elements, said resistance network having first and second idle current detecting terminals for detecting idle currents of said first and second amplifying elements, respectively, and a signal detecting terminal for detecting a signal output current,

said first error amplifier amplifying an error voltage between a voltage at said first idle current detecting terminal and a voltage which provided by level-shifting a voltage at said circuit input terminal by a predetermined value,

said second error amplifier amplifying an error voltage between a voltage at said second idle current detecting terminal and a voltage which provided by level-shifting a



voltage at said circuit input terminal by a predetermined value, and

at least one input terminal of each of said first and second error amplifiers being connected to said signal detecting terminal of said resistance network,

wherein when said first error amplifier operates in response to an error voltage between a voltage at said first idle current detecting terminal and a voltage provided by level-shifting a voltage at said circuit input terminal, said second error amplifier operates in response to an error voltage between a voltage at said second idle current detecting terminal and a voltage which is provided by level-shifting a voltage at said signal detecting terminal, and

when said second error amplifier operates in response to an error voltage between a voltage at said second idle current detecting terminal and a voltage provided by level-shifting a voltage at said circuit input terminal, said first error amplifier operates in response to an error voltage between a voltage at said first idle current detecting terminal and a voltage which is provided by level-shifting a voltage at said signal detecting terminal.

4,558,289

BIAS AND AGC CONTROL OF TWO RF AMPLIFIERS WITH A SHARED CONTROL ELEMENT

Max W. Muterspaugh, Indianapolis, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed Dec. 23, 1983, Ser. No. 564,913
Int. Cl.⁴ H03G *3/18*
U.S. Cl. 330—278 **8 Claims**

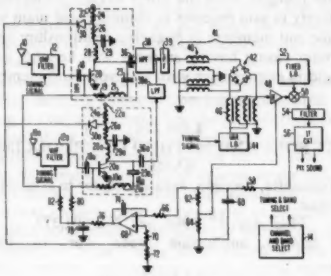
8. Apparatus for tuning a receiver to various channels comprising:

a plurality of bipolar common emitter configured transistor RF amplifiers for amplifying RF signals in respective frequency bands;

band selection means for selecting one of said amplifiers depending on the selected channel;

a source of an automatic gain control signal;

a single varying means having input, output, and control terminals, said control terminal being coupled to said source of automatic gain control signal, for varying the bias of said transistors in accordance with said automatic gain control voltage and thereby varying the gain of said amplifiers; and



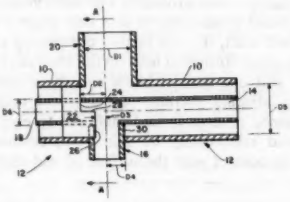
a plurality of selection means responsive to said band selection means for selectively coupling said input and output terminals of said single varying means between the collector and base electrodes of a selected one of said transistor RF amplifiers for coupling said single varying means in a DC feedback configuration between the collector and base electrodes of said selected transistor RF amplifier.

4,558,290

COMPACT BROADBAND RECTANGULAR TO COAXIAL WAVEGUIDE JUNCTION

Joseph C. Lee, Lexington, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 11, 1984, Ser. No. 598,949
Int. Cl.⁴ H01P *5/12, 1/16*
U.S. Cl. 333—126 **11 Claims**



9. A waveguide junction comprising:

a coaxial waveguide having a tubular outer conductor and a concentric inner conductor;

a rectangular waveguide orthogonally coupled to said outer conductor of said coaxial waveguide; and

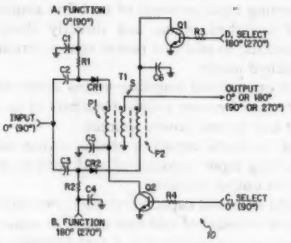
a shorting member disposed between said inner and said outer conductor of said coaxial waveguide, said shorting member having a planar step therein adjacent the junction of said coaxial waveguide and said rectangular waveguide, said step being normal to the longitudinal axis of said rectangular waveguide and parallel to the longitudinal axis of said coaxial waveguide, said shorting member completely filling the space between said inner conductor and said outer conductor of said coaxial waveguide on one side of said junction.

4,558,291

PHASE SHIFTER FOR BROADBAND RADIO SIGNAL

Richard A. Nichols, Richardson, Tex., assignor to Rockwell International Corp., Dallas, Tex.

Filed Dec. 28, 1982, Ser. No. 454,137
Int. Cl.⁴ H03H *7/20, 7/21*
U.S. Cl. 333—138 **13 Claims**



1. A circuit capable of vector magnitude control and phase reversal for an intermediate frequency radio signal, comprising:

a first signal path leading from an input of said circuit and including a first transformer primary winding;

a second signal path leading from said input and including a second transformer primary winding;

a transformer secondary winding connected to deliver, to an output of said circuit, the signal from the first primary winding in a noninverted fashion and to deliver to said output in an inverted fashion the signal from the second primary winding;

means, including a function control input, for interacting with said paths to provide at said output, the radio signal at said input scaled by a factor in accordance with the associated function control input; and

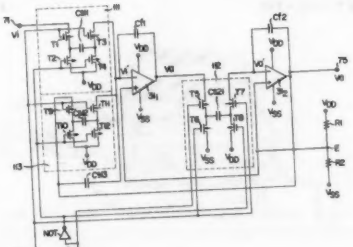
means, including a select input, for selecting between said first and second paths.

4,558,292

LOW PASS FILTER

Itsuo Sasaki, Kawasaki, and Kenji Matsuo, Yokohama, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Jul. 2, 1982, Ser. No. 394,613
Claims priority, application Japan, Sep. 1, 1981, 56-137234
Int. Cl.⁴ H03H *11/00*
U.S. Cl. 333—173 **5 Claims**



1. A low pass filter comprising:

first and second power source terminals for connection to first and second power sources, respectively;

first operational amplifier means connected to said first and

second power source terminals to be driven by said first and second power sources;

first feedback capacitor means connected between the inverting input terminal of said first amplifier means and its output terminal;

a first switched capacitor circuit connected between a signal input terminal applied with an input voltage signal and the inverting input terminal of said first amplifier means in a first switched mode, and directly short-circuited and connected to said first power source terminal in a second switched mode;

second operational amplifier means connected to said first and second power source terminals to be driven by said first and second power sources;

second feedback capacitor means connected between the inverting input terminal of said second amplifier means and its output terminal;

a second switched capacitor circuit connected between said output terminal of said first amplifier means and said first power source terminal in a first switched mode, and between said inverting input terminal of said second amplifier means and said second power source terminal in a second switched mode;

a third switched capacitor circuit connected between said output terminal of said second amplifier means and said inverting input terminal of said first operational amplifier means in a first switched mode, and directly short-circuited and connected to said first power source terminal in a second switched mode;

parallel connected capacitor means connected in parallel with said third switched capacitor circuit, said capacitor means being connected between the inverting terminal of said first amplifier means and the output terminal of said second amplifier means; and

a bias circuit connected to said first and second power source terminals source terminals for producing a bias voltage, said bias voltage being connected to the non-inverting input terminals of said first and second amplifier means,

said first, second and third switched capacitor circuits being separated from the non-inverting input terminals of said first and second amplifier means.

4,558,293

SOLENOID ASSEMBLY

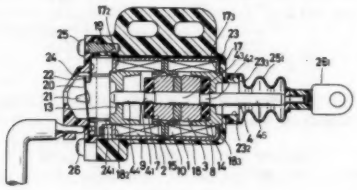
Hideo Haneda, and Minoru Yamanaka, both of Toyota, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Aichi, Japan

Filed Nov. 23, 1983, Ser. No. 554,667

Claims priority, application Japan, Nov. 25, 1982, 57-206441; Nov. 25, 1982, 57-206442; Nov. 25, 1982, 57-206443; Nov. 25, 1982, 57-206440

Int. Cl.⁴ H01F *7/08*

U.S. Cl. 335—255 **19 Claims**



1. A solenoid assembly comprising:

(a) a magnetic plunger;

(b) an electric coil for generating a magnetic flux in a direction along an axis of said magnetic plunger;

(c) a main yoke composed of at least two separate substantially identical members diametrically opposed relative to said plunger for defining a magnetic flux passage around said electric coil;

(d) a pair of yoke end members held in engagement respectively with opposite ends of said main yoke;

(e) an outer casing;

(f) one of said main yoke and said yoke end members having recesses extending substantially normally to said axis of said magnetic plunger, with the other having projections fitted respectively in said recesses to maintain said main yoke and said yoke end members in engaging relationship; and

(g) said outer casing having an inner wall keeping said main yoke held in engagement with said yoke end members.

4,558,294

MAGNET ROLL AND METHOD OF PRODUCING THE SAME

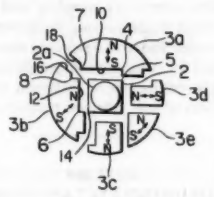
Keitaro Yamashita, Kansato, Japan, assignor to Hitachi Metals, Ltd., Japan

Filed Apr. 17, 1984, Ser. No. 601,372

Claims priority, application Japan, Apr. 18, 1983, 58-56795[U]

Int. Cl.⁴ H01F *7/02*

U.S. Cl. 335—303 **8 Claims**



1. A cylindrical magnet roll of the type having a plurality of magnet blocks each formed from magnet powder bonded in plastic, the roll comprising a shaft having a polygonal cross section, the plurality of magnet blocks being bonded to said shaft and abuttingly contacting, and being bonded to, each other, at least one of said magnet blocks having mating means which is in contact with corresponding mating means of said shaft, said mating means providing a predetermined circumferential and radial positioning of said one magnet block with respect to said shaft, the roll further comprising complementary mating means formed at least on the respective contacting surfaces of said one magnet block and the magnetic blocks immediately adjacent thereto, said adjacent magnet blocks being positioned relative to said shaft and to each other in a predetermined relationship by said complementary mating means and by contact with the surface of said shaft.

4,558,295

TUNABLE-INDUCTANCE MAGNETICALLY-SOFT FERRITE CORE STRUCTURES

Robert W. Olmsted, and Joseph F. Huth, III, both of Butler, Pa., assignors to Spang & Company, Butler, Pa.

Filed Nov. 5, 1982, Ser. No. 439,371

The portion of the term of this patent subsequent to Apr. 16, 2002, has been disclaimed.

Int. Cl.⁴ H01F *15/02, 21/06*

U.S. Cl. 336—83 **1 Claim**

1. Adjustable air gap ferrite pot core assembly comprising, in combination

a pair of magnetically-soft ferrite pot core elements,

each such core element including an elongated center post symmetrical about a centrally located longitudinal axis, a web extending in transverse relation to such axis contiguous to one longitudinal end of the center post, and a skirt extending from the web generally parallel to and in spaced

relation from the center post defining a space for coil windings between the center post and the skirt,

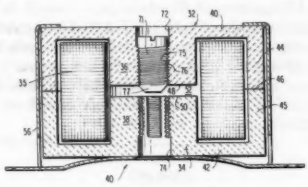
each core element skirt terminating in a mating surface for contacting the corresponding mating surface on the remaining core element skirt when in assembled relationship,

the center post of each core element terminating in a distal end surface with such distal end surfaces of the pair of core elements being spaced axially from one another to define a predetermined air gap when the mating surfaces of the skirts of such pair of core elements are in contacting relationship,

each core element center post presenting an internal wall surface defining a central opening, such central openings being in axial alignment when the pair of core elements are assembled for receiving an elongated air-gap adjustor for axially-directed movement within such central openings,

unitary die means consisting of discontinuous helically-oriented threads for providing longitudinal movement along such core element central opening of an elongated air gap adjustor upon rotation within such unitary die means,

such unitary die means being located along at least a portion of the internal wall surface of the central opening of at least one of such core elements, and



an elongated air gap adjustor comprising in combination,

an elongated unitary magnetically-soft ferrite shaft which is substantially symmetrical about its central longitudinal axis, and

a nonmagnetic material integral with such unitary ferrite shaft establishing a nonmagnetic working surface circumscribing external periphery sidewall of such elongated unitary ferrite shaft intermediate its longitudinal ends,

such nonmagnetic working surface presenting a substantially cylindrical configuration,

such working surface nonmagnetic material being free of helical threads prior to being used within the central opening of an assembled ferrite pot core,

such nonmagnetic material presenting in combination with such ferrite shaft a predetermined maximum transverse cross-sectional dimension for such working surface measured in a plane perpendicular to such central longitudinal axis,

such predetermined transverse cross-sectional dimension enabling such adjustor to be cooperatively received within such unitary die means to provide for axial positioning of such adjustor upon rotation within such central opening.

4,558,296

SOUND DAMPING DEVICES

Stellan Thoren, Västerås, Sweden, assignor to ASEA Aktiebolag, Västerås, Sweden

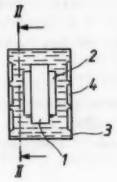
Filed Feb. 5, 1985, Ser. No. 698,478

Claims priority, application Sweden, Feb. 14, 1984, 8400776

Int. Cl.[4] H01F *15/00*

U.S. Cl. 336—100 **11 Claims**

1. A sound damping device for an inductive a.c. apparatus with an iron core (1), an enclosure tank (3) and an insulating fluid located in the enclosure tank, comprising at least one hollow sound damping plate (4) arranged in said enclosure tank, said sound damping plate having a front wall (6,6') with an outside and an inside, said outside facing said iron core (1), and a rear wall (5,5'), said walls being connected to each other along the circumference of said damping plate in such a way that a pressure-tight cavity (9,9') is defined by means of said walls, said cavity (9,9') containing a gas which, at room temperature and in case of a normal level of said insulating fluid, has a pressure of at most 600 mbar, the intermediate gap between said walls containing at least one force-transmitting



member made of solid material and arranged to transmit compressive forces from said front wall to said rear wall, the internal surface of said front wall having at least one contact surface portion arranged in contact with said at least one force-transmitting member, wherein at least part of the corresponding contact surface area of said at least one force-transmitting member belongs to at least one elastically resilient force-transmitting member (8,10').

4,558,297

SATURABLE CORE CONSISTING OF A THIN STRIP OF AMORPHOUS MAGNETIC ALLOY AND A METHOD FOR MANUFACTURING THE SAME

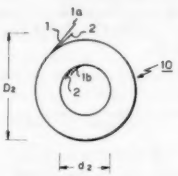
Masao Shigeta, Urayasu, and Teruhiko Ojima, Nagareyama, both of Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Oct. 4, 1983, Ser. No. 538,886

Claims priority, application Japan, Oct. 5, 1982, 57-174795; Nov. 24, 1982, 57-206639; Jul. 28, 1983, 58-136885

Int. Cl.[4] H01F *27/24*

U.S. Cl. 336—213 **13 Claims**



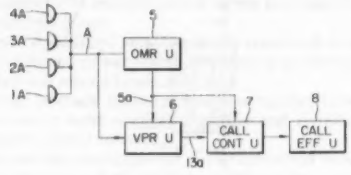
1. A saturable core comprising a heat treated coiled thin strip of amorphous magnetic alloy, said heat treated coiled thin strip having a coiling direction identical to a coiling direction thereof during heat treatment thereof, and an electrically insulating film of organic material, having a low heat resistance at a heat treating temperature of said heat treated coiled thin strip in the range from 300°–500° C., interposed between and electrically insulating neighboring coiled layers of said heat treated coiled thin strip.

4,558,298

ELEVATOR CALL ENTRY SYSTEM

Kiyoji Kawai, Gifu, and Tadashi Omori, Nagoya, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 8, 1983, Ser. No. 473,358
Claims priority, application Japan, Mar. 24, 1982, 57-46551
Int. Cl.[4] B66B *13/00*
U.S. Cl. 340—19 R **6 Claims**



1. An elevator call entry device in which a cell is entered by the voice uttered by a passenger, said device comprising

voice receiving means provided on the floor or in an elevator car and operable to receive the voices uttered by the passenger and to produce a signal corresponding thereto;

oral message recognizing means responsive to signals from said voice receiving means to extract therefrom signals indicative of a voice demanding a call entry and stating the floor of destination or a voice demanding cancellation of a call entry, and to produce oral message signals indicative of the contents of the extracted signals;

voiceprint recognition means operable to recognize and sequentially store voiceprints of the voice signals received from said voice receiving means and to supply an output signal when the previously stored voiceprint of the voice demanding a call entry is coincident with the voiceprint of a voice demanding subsequent cancellation of the call entry;

call control means responsive to said oral message signal to supply a command to enter the demanded call in accordance with said oral message signal, said call control means being connected to said voiceprint recognizing means and operable to supply a command to cancel the call entry upon reception of said output signal from said voiceprint recognizing means; and

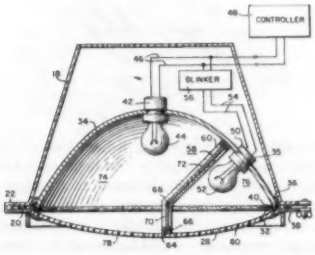
call effecting means responsive to an entry command and an entry cancellation command issued by said call control means to effect call entry and call entry cancellation.

4,558,299

TURN-ON-RED TRAFFIC SIGNAL

Donald M. Conn, Rte. 728, Weems, Va. 22576

Filed Nov. 25, 1983, Ser. No. 554,870
Int. Cl.[4] B60Q *1/46*
U.S. Cl. 340—81 R **5 Claims**



1. In a traffic light structure for selectively controlling the flow of traffic approaching along a roadway from one direction, the structure having a housing including a stop-light section supporting a unitary lens which is red in all areas and which has an inner surface, and the housing supporting a concave reflector having a reflecting surface facing toward said inner lens surface, and the housing supporting a main lamp in the reflector connected by wiring to a traffic controller, additional structure capable of quick and economical installation in said stop-light section and operative for indicating to traffic that it is permissible when the main lamp is illuminated to turn after stopping and proceed in a direction transverse to the roadway being controlled, comprising:

(a) a partition supported in the reflector and having inner edges shaped to continuously fit the contour of the reflecting surface and the partition having outer edges contoured to continuously fit the contour of the inner surface of the lens, and the partition including means to maintain it in a selected position against said reflecting and lens surfaces and being disposed to divide the space between the lens and the reflector into a major zone which includes within it said main lamp and a non-communicating minor zone of lesser size located offset from the center of the lens toward said direction in which a turn after stopping is permitted, and the outer edge of the partition contacting the lens and being shaped to determine the shape of a dividing line between the major and the minor zones of the lens;

(b) an auxiliary source of light located within the reflector on the opposite side of the partition from the main lamp and disposed behind the minor zone of the lens; and

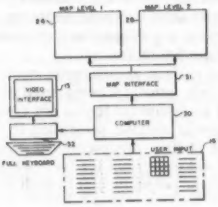
(c) means for intermittently flashing the auxiliary source of light behind the minor zone of the lens whenever the main lamp is illuminated.

4,558,300

COMPUTER MAP

Saul Goldman, Toronto, Canada, assignor to Computer Sign Systems Limited, Markham, Canada

Filed Jul. 15, 1982, Ser. No. 398,510
Int. Cl.[4] G08G *1/00*
U.S. Cl. 340—286 M **1 Claim**



1. A directory console and mount for a multi-level building, said building having at least two floors, said console being located on one floor of said building and comprising:

(a) a first floor plan map of said one floor of said building and a separate second floor plan map of the other floor of said building, said first floor plan map including a display of the location of said console, each floor plan map displaying a plurality of stations on its associated floor, each floor plan map further displaying paths connecting said stations and access means for use in movement between said floors, said display of said access means including a display of the direction of movement form said one floor to said other floor,

(b) a plurality of path indicator lights each in a first colour for indicating, when illuminated, a path from said console to a selected station,

(c) a plurality of station indicator lights one for each station and each of a different colour from said first colour, for illuminating a selected station,

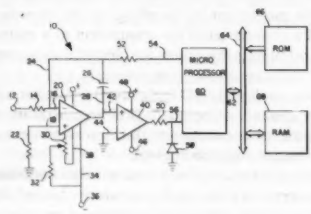
(d) a direction indicator light for illuminating said display of said access means,
(e) a directory identifying the stations displayed on each of said floor plan maps,
(f) a keyboard at which a particular station on either of said floor plan maps can be selected,
(g) station indicating means responsive to the selection on said keyboard of a particular station for illuminating on the floor plan map on which said station is displayed the station light associated with such station,
(h) and path indicating means responsive to the selection on said keyboard of a said particular station on said second floor plan map for illuminating on the first floor plan map those path indicator lights which define a path extending from said console to said access means, and for illuminating on the second floor plan map those path indicator lights defining a path extending from said access means to said particular station, and for illuminating said direction indicator light at said access means.

4,558,301

VOLTAGE-TO-FREQUENCY AND ANALOG-TO-DIGITAL CONVERTER CIRCUIT

Frederick N. Trofimenkoff, Calgary, Canada; Jai Bhagwan, c/o Dept. of Elec. Engg., University of Calgary, Calgary, Alberta, T2N 1N4, Canada, and Sandro P. Poscente, 3383 Breton Cl. NW., Calgary, Alberta, T2L iX3, Canada, assignors to Trofimenkoff Engineering, Ltd., Alberta; Jai Bhagwan, Montreal; Sandro Poscente and Governors of the University of Calgary, both of Calgary, all of, Canada

Filed Jul. 1, 1982, Ser. No. 394,170
Int. Cl.[4] H03K *13/20*
U.S. Cl. 340—347 AD **2 Claims**



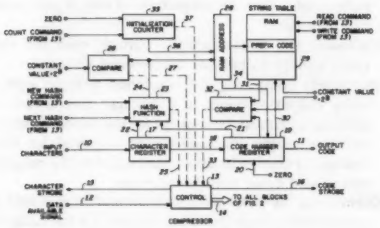
1. An voltage-to-frequency and analog-to-digital converter circuit, comprising:
(a) an integrator circuit including an operational amplifier having positive and negative input terminals and an output line,
(b) the integrator circuit having a feedback line which contains a feedback capacitor and is connected between the output line and the negative operational amplifier input terminal,
(c) an analog signal input line, which contains an input resistance, and is connected in parallel with the feedback line and said terminal,
(d) a reference signal line which contains a reference resistance, and is connected in parallel with the feedback and analog signal input line,
(e) a line containing a compensation resistor connected to the positive operational amplifier input terminal,
(f) the value of the compensation resistor being equal to the parallel resistance value of the input and the reference resistances,
(g) microprocessor means having a flag input connected to the operational amplifier circuit output line and also a reference pulse Q output connected to the other end of the reference signal line for supplying a train of positive pulses which discharge the feedback capacitor,
(h) the microprocessor means comparing the output signal from the operational amplifier circuit to a predetermined reference level value to initiate a standard test period control pulse when the reference level value is exceeded and simultaneously triggering a reference discharge pulse during such test period and transmitting it along the reference pulse output line and across the reference resistance to the negative operational amplifier input terminal to discharge the feedback capacitor for providing a time rate of reference pulses which is proportional to the analog input signal, where the pulse frequency is equal to the product of the input voltage and reference resistance value divided by the product of the restoring pulse voltage, the input resistance and the reference pulse duration time, and
(i) the microprocessor means for counting the number of reference discharge pulses that are required in a measurement period made up of a predetermined number of test periods to provide a digital representation of the analog input voltage.

4,558,302

HIGH SPEED DATA COMPRESSION AND DECOMPRESSION APPARATUS AND METHOD

Terry A. Welch, Concord, Mass., assignor to Sperry Corporation, New York, N.Y.

Filed Jun. 20, 1983, Ser. No. 505,638
Int. Cl.[4] G06F *5/00*
U.S. Cl. 340—347 DD **181 Claims**



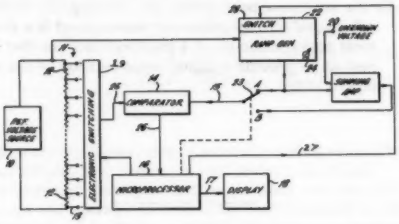
1. In a data compression and data decompression system, compression apparatus for compressing a stream of data character signals into a compressed stream of code signals, said compression apparatus comprising
storage means for storing strings of data character signals encountered in said stream of data character signals, said stored strings having code signals associated therewith, respectively,
means for searching said stream of data character signals by comparing said stream to said stored strings to determine the longest match therewith,
means for inserting into said storage means, for storage therein, an extended string comprising said longest match with said stream of data character signals extended by the next data character signal following said longest match,
means for assigning a code signal corresponding to said stored extended string, and
means for providing the code signal associated with said longest match so as to provide said compressed stream of code signals.

4,558,303

METHODS OF AND APPARATUS FOR CONVERTING AN ANALOGUE VOLTAGE TO A DIGITAL REPRESENTATION

John S. Fielden, Ottery St. Mary, England, assignor to South Eastern Electricity Board, England

Continuation of Ser. No. 294,658, Aug. 20, 1981, abandoned.
This application Feb. 1, 1984, Ser. No. 576,063
Claims priority, application United Kingdom, Sep. 1, 1980, 8028186
Int. Cl.[4] H03K *13/02*
U.S. Cl. 340—347 AD 14 Claims



1. A method of converting an input analogue voltage to a digital output signal indicative of the magnitude of the input analgoue voltage, said method comprising:

applying a fixed reference voltage to a potential divider having N equal stages, each stage being of one unit magnitude, to provide (N+1) divider output voltages at equal voltage intervals, the input analogue voltage having an integral value component corresponding to a maximum integral number of said equal voltage intervals and a fractional value component corresponding to the difference between said integral value component and the actual value of the input analogue voltage;

generating a ramp voltage having a maximum ramp amplitude greater than the magnitude of one of said equal voltage intervals;

combining the input analogue voltage with the reference ramp voltage to provide a combined voltage;

repetitively comparing the combined voltage with the divider output voltages at a regular comparison rate to provide a plurality of comparisons with the divider output voltages during the time period required for the ramp voltage to change by an amount equal to the magnitude of one of said equal voltage intervals;

determining the number of said comparisons at said regular comparison rate in the time required for the ramp voltage to change by an amount equal to the magnitude of one of said voltage intervals;

determining the proportion of said number of said comparisons at said regular comparison rate in the time required, after the ramp voltage is at a magnitude corresponding to the output voltage of one of said divider stages, for the combined voltage to reach magnitude corresponding to the output voltage of one of the divider stages;

digitally determining from said proportion the fraction of the magnitude of said equal voltage intervals representing said fractional value component of the actual magnitude of the input analogue voltage; and

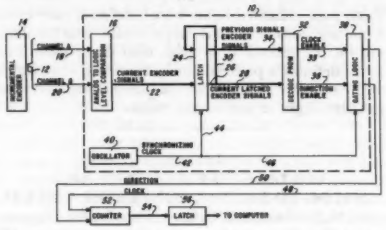
on each said comparison summing the digital values Q, which corresponds to the largest integral number of said equal voltage intervals contained in each repetitively compared combined voltage, averaging the sum over said number of successive comparisons and deducting the digital value of the ramp voltage at the start of said summing and averaging from said averaged sum to provide a digital output signal indicative of the actual magnitude of the input analogue voltage.

4,558,304

INCREMENTAL ENCODER SYNCHRONOUS DECODE CIRCUIT

Martin A. Wand, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 24, 1983, Ser. No. 469,186
Int. Cl.[4] H03K *13/02*
U.S. Cl. 340—347 SY 4 Claims



1. In a positioning system including an n-line incremental encoder connected to a servomotor of an object positioning servosystem and generating one line per cycle having four transitions per encoder line for a gray code in response to movement of an object in a preselected dimension, a counter for timing the movement of the object in the preselected dimension and a counter latch for connection to a system computer for determining the count for distance measurement, a synchronous decoder circuit comprising:

(a) an analog-to-digital (AD logic level) converter having an in phase channel comparator and a quadrature channel comparator for connection to the incremental encoder for conditioning the signals thereof;

(b) a signal synchronizing latch operatively connected to the AD converter in phase and quadrature channel comparators for receiving the latest conditioned encoder signals, said latch having a feedback circuit for feeding back the latest conditioned encoder signals to the latch where they are delayed for providing previous latched encoder signals together with the latest conditioned encoder signals;

(c) a programmable decode read only memory (PROM) operatively connected to the synchronization latch for decoding the latest and previous encoded signals for determining direction, said PROM being programmed with a gray code;

(d) a gating logic circuit operatively connected to the PROM for receiving clock enable signals and direction enable signals; and

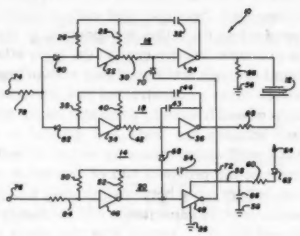
(e) a clock generator operatively connected to the in phase and quadrature channel comparators, synchronization latch and gating logic circuit for clocking the synchronous decode circuit, said clock for generating a plurality of counter clock pulses at a preselected frequency determined by the number of counter clocks generated per encoder line (scale factor), encoder lines per revolution and servosystem operating speed;

whereby the in phase channel and quadrature channel signals, respectively, start low and high to provide a gray code for each cycle in a first direction and conversely for each cycle in a second direction for comparison with the gray code of the PROM for direction of movement determinations.

4,558,305
MULTIPLE TONE SIGNALING DEVICE

Donald E. Black, Indianapolis; Louis P. Sweany, Carmel, and James D. Pirtle, Lawrence, all of Ind., assignors to Emhart Industries, Inc., Indianapolis, Ind.

Filed Dec. 20, 1982, Ser. No. 450,965
Int. Cl.[4] G08B *3/00*
U.S. Cl. 340—384 E **9 Claims**

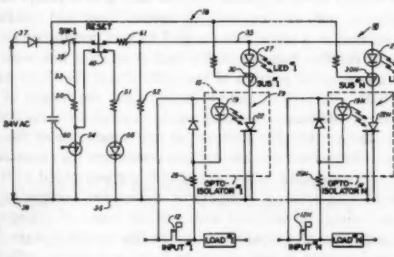


1. A signaling device, comprising
an audio output device;
a first oscillator circuit means for oscillating at a first frequency;
a second oscillator circuit means for oscillating at a second frequency;
a third oscillator circuit means for oscillating at a third frequency;
means coupling said audio output device to said first and second oscillator circuit means;
first input terminal circuit means coupled to said first and second oscillator circuit means for allowing enabling of either or both of said first and second oscillator circuit means;
circuit means coupling said third oscillator circuit means to said first and second oscillator circuit means for disabling either said first or second oscillator circuit means in response to said third oscillator circuit means; and
second input terminal circuit means coupled to said third oscillator circuit means for enabling control of said third oscillator circuit means.

4,558,306
CONTACT MONITOR-ANNUNCIATOR

Robert A. Freliech, Fayetteville, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Nov. 21, 1983, Ser. No. 553,732
Int. Cl.[4] G08B *23/00*
U.S. Cl. 340—520 **5 Claims**

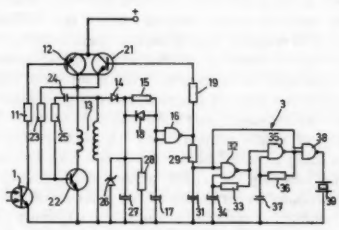


1. In a mobile refrigeration unit, apparatus for identifying a fault in one of a plurality of engine related functions that includes
a monitoring means that includes:
(a) a plurality of monitoring circuits connnected to the engine to monitor different engine related functions,
(b) actuating means in each monitoring circuit for energizing the said circuit when a fault in the monitored function occurs,
(c) a light emitting means in each monitoring circuit for providing an optical output signal when the circuit is energized,
an annunciator means that includes:
(a) a plurality of warning circuits equal in number to the number of monitoring circuits, each warning circuit containing an indicator means, and a light activated means for optically coupling the warning circuit to one of said monitoring circuits,
(b) an independent power supply connected to the warning circuits to energize the indicator means when an optical signal is received by the light activated means,
(c) a unilateral switch in series with the indicator means and said light activated means for holding the said indicator means energized after the optical output signal is terminated, and
(d) current limiting means connected between the power supply and each of the warning circuits for preventing a second indicator means from being energized after a first indicator means is energized.

4,558,307
REMINDER DEVICE

Roland R. Lienart van Lidt de Jeude, 38 Avenue des Traquets, B-1160 Brussels, Belgium

Filed Jul. 12, 1983, Ser. No. 513,021
Claims priority, application Luxembourg, Sep. 8, 1982, 84369
Int. Cl.[4] G08B *23/00*
U.S. Cl. 340—527 **4 Claims**



1. A reminder device adapted to be secured to an object comprising
a box formed with an aperture in which a photosensitive cell is secured, said cell being adapted to produce an electrical signal when irradiated by ambient radiation;
amplifier means having its input connected to the output of said photosensitive cell;
electric transformer means having a primary winding connected to be fed by the output signal of said amplifier means and having a secondary winding;
first delay means connected across the secondary winding of said transformer means;
logic gate means connected to said first delay means to be switched by the output signal from the delay means to provide a control signal;
output gate means having a first input connected to accept said control signal and a second input, said output gate means having its output connected to an audible signal generator;
second delay means connected across the output of said logic gate means;
switching means having its input connected to said second delay means and having its output connected to the second input of said output gate means, said switching means

being responsive to the output signal from said second delay means to inhibit the control signal for said audible signal generator thereby interrupting the audible warning signal after a predetermined interval of time.

4,558,308

INTRUSION WARNING WIRE-LATTICE, AND METHOD AND DEVICE FOR MANUFACTURING SAME

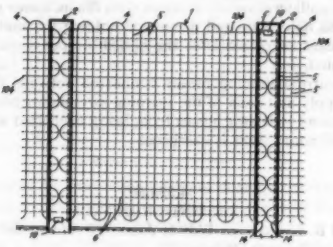
Jacques Ciordinik, Bologna, and Alessandro Penzo, Crespellano, both of Italy, assignors to CI.KA.RA. S.p.A., Bologna, Italy

Filed Aug. 4, 1980, Ser. No. 174,937

Claims priority, application Italy, Aug. 7, 1979, 12710 A/79; Feb. 29, 1980, 12461 A/80

Int. Cl.⁴ G08B *13/12*; E21C *29/16*

U.S. Cl. 340—550 **6 Claims**



1. A wire-lattice intrusion warning arrangement comprising in combination solid wires and hollow wires having substantially the same outward appearance as the solid wires whereby said hollow wires appear to serve the same mechanical barrier function as the solid wires, said hollow wires including conductive material means located within the hollow interior thereof, and warning system means operatively connected to the conductive material means, said warning system means being responsive to variations in the conductive capability of the conductive material means to thereby give warning of the presence of intruders, said solid and hollow wires forming a plurality of single prefabricated wire-lattice sections, each section being mounted between two box-type hollow posts in a manner enabling the hollow wires forming part of the wire-lattice sections to terminate at the interior of the box-type posts, conductive material means in two adjoining wire-lattice sections being connectable together at the interior of a box-type post.

4,558,309

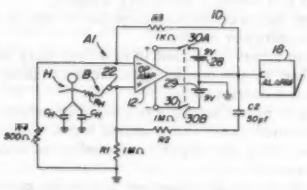
GROUND TETHER CONTINUITY MONITOR

John N. Antonevich, Lansdale, Pa., assignor to The Simco Company, Inc., Hatfield, Pa.

Filed Jun. 27, 1983, Ser. No. 507,977

Int. Cl.⁴ G01R *31/02*

U.S. Cl. 340—649 **20 Claims**



1. In combination with an electrically conductive tether for grounding a substantially non-conductive body to prevent build-up of static charges thereon, a monitor for detecting any break in electrical continuity between the body and ground, comprising:

frequency generator means for developing an A.C. output,

alarm means coupled to the output of said frequency generator means,

means associated with said frequency generator means and constituting an impedance network defining a frequency determining circuit therefor, said impedance network including a branch adapted to provide a continuous conductive path between said non-conductive body and ground when the tether is connected to the monitor, and

means to couple the distal end of the body-attached tether to ground through said impedance network, said impedance network being so constructed and arranged that the A.C. output of said frequency generator means when continuity exists between the body and ground is insufficient to actuate said alarm means by virtue of body capacitance present at the proximal end of the tether and, when any break in continuity between the body and ground occurs, absence of body capacitance will so change the characteristics of the A.C. output that the alarm means will be actuated.

4,558,310

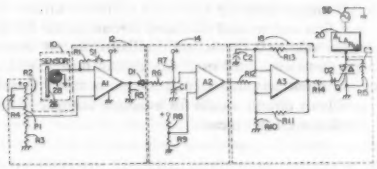
CURRENT SENSING DEVICE AND MONITOR

Raymond J. McAllise, 1812 Bruce St., Canal Fulton, Ohio 44614

Filed Sep. 29, 1982, Ser. No. 427,116

Int. Cl.⁴ G08B *21/00*

U.S. Cl. 340—661 **14 Claims**



1. A system for sensing and responding to an alternating current flowing through an electrical conductor, said system comprising a current sensor for sensing the current in at least one conductor and for producing an output voltage related in magnitude to the magnitude of the current flowing through such at least one conductor, said current sensor being a coil of wire wound about a central axis and arranged adjacent to said conductor with said central axis spaced from said conductor and located in a plane non-parallel to said conductor so that some of the flux lines encircling said conductor link with said coil, a substantial portion of the path of said flux lines which link with said coil extending through air, the length of said portion of said flux path which passes through air being considerably longer than the diameter of said conductor so that said coil can be moved sidewise of said conductor into association with said conductor in the course of being assembled with said conductor, a sensing comparator means for comparing the output voltage of said coil with a preset value of voltage and for producing an output signal when the output voltage from said coil departs in one direction from said preset voltage, a duration detector connected with said sensing comparator and operable to produce an output signal when the output from said sensing comparator has persisted for a predetermined amount of time, and means responsive to said output of said duration detector.

4,558,311

METHOD AND APPARATUS FOR MONITORING THE TOOL STATUS IN A TOOL MACHINE WITH CYCLIC MACHINING

Roland Forsgren, Västerås; Gunnar Garpendahl, Åkersberga; Hans Eriksson, Uppsala, and Bengt Wallentin, Sollentuna, all of Sweden, assignors to KB WIBRA, Västerås, Sweden

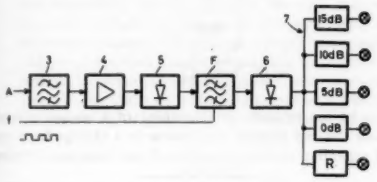
PCT No. PCT/SE82/00120, § 371 Date Dec. 10, 1982, § 102(e) Date Dec. 10, 1982, PCT Pub. No. WO82/03589, PCT Pub. Date Oct. 28, 1982

PCT Filed Apr. 13, 1982, Ser. No. 448,853

Claims priority, application Sweden, Apr. 13, 1981, 8102372

Int. Cl.⁴ G08B *21/00*

U.S. Cl. 340—680 **10 Claims**



1. Method of monitoring the tool status in a machine tool comprising the steps of measuring the vibration level (A) of the machine tool within at least one narrow frequency band, which is controlled by the machining cycle frequency (f), and comparing the obtained vibration level to at least one corresponding reference level, an alarm signal being outputted if the detected vibration level deviates unacceptably from the reference level.

4,558,312

POSITION DETECTING DEVICE

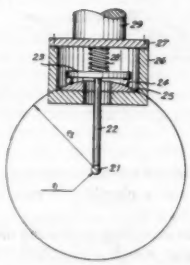
Hiroshi Yonemoto, Saitama; Akihisa Narimatsu, Tokyo, and Nobuyuki Suzuki, Kanagawa, all of Japan, assignors to Sony Magnescale Incorporated, Tokyo, Japan

Filed Mar. 3, 1983, Ser. No. 471,680

Claims priority, application Japan, Mar. 5, 1982, 57-35504; Mar. 5, 1982, 57-35505; Mar. 5, 1982, 57-35506; Nov. 18, 1982, 57-203476

Int. Cl.⁴ G08B *21/00*

U.S. Cl. 340—680 **40 Claims**



1. An apparatus for use with an electrical circuit for detecting a location of a surface of a solid object, comprising:

a housing;

a stylus having an electrically conductive electrode contact at one end thereof for contacting a surface of said object;

stylus support means for supporting said stylus to permit freedom of movement in at least two dimensions, being arranged within said housing and formed of at least two support members, one of said two support members having a spherical surface concentric with the center of said electrode contact and being biased into contact with the other of said two support members for mutual movement therebetween, said electrical circuit being responsive to said electrode contact's touching said surface of said solid object.

4,558,313

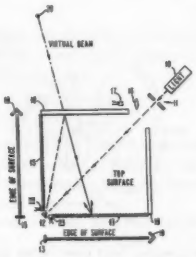
INDICATOR TO DATA PROCESSING INTERFACE

Richard L. Garwin, Scarsdale, and James L. Levine, Yorktown Heights, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 336,461, Dec. 31, 1981, abandoned. This application Nov. 1, 1984, Ser. No. 667,509

Int. Cl.⁴ G09G *1/00*

U.S. Cl. 340—709 **14 Claims**



1. Interface apparatus for translating the location of a manually established position on a surface area into data useful in a data processing operation comprising in combination:

a manually positionable member,

a surface area,

means for providing scanning light motion in a plane essentially parallel with and adjacent to said area with at least one light beam along at least two linear essentially perpendicular directions,

a light responsive detector member positioned at one end of the scanning light travel in each said direction,

means for retroreflective light enhancement employing a material that reflects back toward the source a large fraction of incident light the amount being relatively insensitive to the angle of incidence coextensive with the length of each said direction so positioned that said area is between said scanning light and said retroreflective light enhancement means,

light sensing means responsive to retroreflected light as said scanning light passes said manually positionable member, and

means specifying the location of the position of said manually positionable member based on said change of reflected light in relation to the time said scanning light strikes said detector.

4,558,314

CONDUCTIVE FLUID OPTICAL DISPLAY PANEL AND METHOD OF MANUFACTURE

Robert Fooshee, 4323 Clear Park Pl., San Jose, Calif. 95136

Filed Dec. 28, 1982, Ser. No. 454,061

Int. Cl.⁴ G08B *5/00*

U.S. Cl. 340—788 **10 Claims**

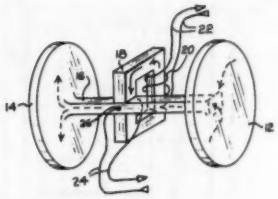
7. The method of manufacturing a display panel having a matrix of individual pixel elements each selectively rendered visible by electromagnetically pumping an electrically conductive fluid to and from a transparent cavity in said element and forming a portion of the surface of said display panel, said conductive fluid being pumped through a conduit coupled to a reservoir cavity, said method including the steps of:

cutting a plurality of pairs of spaced rectangular holes through the surfaces of a ferromagnetic metal panel, each pair of said rectangular holes being positioned at points corresponding to a location of a pixel element;

cutting an interconnecting slit between each rectangular hole in each of said plurality of pairs, said slit being substantially normal to a longitudinal axis of said holes and located at positions corresponding to their respective pixel element cavities;

applying a dielectric material to at least a portion of the surface of said ferromagnetic metal panel including the surface portion formed by said slit;

placing current-carrying conductors across each row of rectangular hole pairs, each of said conductors comprising a conductive bridge having two base sections, each section fitting into one of said rectangular holes and against the end of the interconnecting slit;



providing a magnetic field generating coil around a portion of said ferromagnetic metal panel, said coil being operative to develop a magnetic field across said slit between said conductive bridges along an axis substantially perpendicular thereto;

applying to a first surface of said ferromagnetic metal panel a first cavity panel containing a matrix of cavities, each having a central aperture through its inner surface that interconnects with one of said slits;

applying to a second surface of said ferromagnetic metal panel a second cavity panel containing a matrix of reservoir cavities each having a central aperture through its inner surface that interconnects with one of said slits;

filling each of said cavities in said first panel and its respective interconnecting slit with an electrical conductive fluid; and

sealing the exposed matrix cavities in said second cavity panel with a cover panel.

4,558,315

INPUT APPARATUS AND METHOD FOR CONTROLLING THE SCANNING OF A MULTI-CELL DISPLAY

Lawrence H. Weiss, Portland, and Akbar Tahayeri, Beaverton, both of Oreg., assignors to Zygo Industries, Inc., Portland, Oreg.

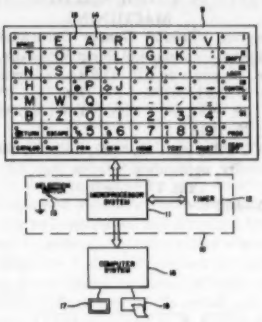
Filed Apr. 11, 1983, Ser. No. 483,733
Int. Cl.[4] G08B 5/22
U.S. Cl. 340—802 **15 Claims**

1. An input device controllable by a user for scanning a display, said display having a plurality of individual display cells, comprising:

(a) switch means actuable by said user for generating a control signal;

(b) scanning means coupled to said display means and receiving said control signal from said switch means, said scanning means activating said display cells according to a plurality of different predetermined scanning modes, each of said scanning modes comprising a plurality of scan transitions, each said scan transition comprising successive activations of at least a respective pair of said display cells, said scanning means including means for changing from one of said scanning modes to another of said scanning modes; and

(c) timing means for establishing predetermined scan transition times between said successive activations and for automatically causing a preselected number of said scan transition



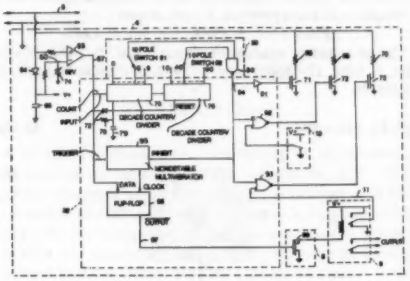
times to be longer near the beginning of a scanning mode than near the end thereof in response to a change from one of said scanning modes to another of said scanning modes.

4,558,316

ELECTRICAL SUPERVISORY CONTROL AND DATA ACQUISITION SYSTEM

Ful K. Yong, 6/27 Lanark St., Clayton, Victoria 3168, Australia

PCT No. PCT/AU81/00040, § 371 Date Dec. 2, 1981, § 102(e) Date Dec. 2, 1981, PCT Pub. No. WO81/02962, PCT Pub. Date Oct. 15, 1981
Continuation-in-part of Ser. No. 326,627, Dec. 2, 1981, abandoned. This PCT application Apr. 10, 1981, Ser. No. 593,183
Claims priority, application Australia, Apr. 10, 1980, PE3076
Int. Cl.[4] H04Q 9/00
U.S. Cl. 340—825.06 **6 Claims**



1. An electrical control system comprising:

a master station and a plurality of receiver stations connected thereto by a bus;

said mastser station including generating means for generating control signals which are applied to said bus and to which said receiver stations are responsive;

said control signals comprising a repetitive series of signal frames, each signal frame including a reset pulse and a plurality of address pulses;

said master station also including control means which can cause selectable alteration of the duration of any address pulse and also the period between successive address pulses;

said receiver stations being respectively addressed in a frame following receipt of a predetermined number of said address pulses after the reset pulse;

the addressed receiver stations being responsive to the duration of the address pulse by which it is addressed whereby output information can be transmitted from the master station to the receiver station thus addressed;

the receiver stations including return signal generating means for generating return signals which vary the impedance of the bus;

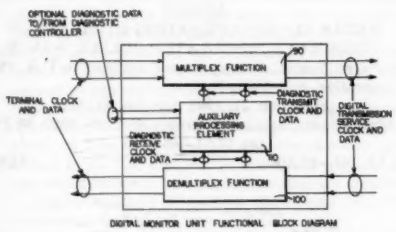
said master station also including measuring means coupled to the bus for measuring the variation of the impedance of the bus; and

the reset pulse of each signal frame being distinguishable from the other pulses thereof by virtue of its relatively long duration, the output information being determined by the duration of the period between successive address pulses and the return signals are generated by varying the bus impedance by the addressed receiver station during the same period that the receiver is addressed, whereby the master station can transmit output information to an addressed receiver station by varying the duration of the period between successive pulses and simultaneously measure the variation of the bus impedance which defines the return signal generated by the addressed receiver.

4,558,317
DIGITAL COMMUNICATION LINK MONITORING DEVICE

Thomas R. Armstrong, Clearwater, Fla., assignor to Paradyne Corporation, Largo, Fla.

Filed Nov. 17, 1982, Ser. No. 442,317
Int. Cl.[4] H04Q *9/00;* **H04J** *3/02;* **G06F** *11/00*
U.S. Cl. 340—825.06 **8 Claims**



DIGITAL MONITOR UNIT FUNCTIONAL BLOCK DIAGRAM

1. A digital data communication system comprising:

data terminal equipment provided at several locations;

a digital data communication media interconnecting said locations and adapted to carry digital data signals;

interfacing means provided between said data terminal equipment and said communication media; and

digital monitor units provided at said several locations and connected between said interfacing means and said data terminal equipment, said digital monitor units being adapted to exchange monitoring data.

4,558,318
MERCHANDISE VERIFICATION AND INFORMATION SYSTEM

Ronald A. Katz, Los Angeles, Calif., and Robert N. Goldman, Kailua, Hi., assignors to Light Signatures, Inc., Los Angeles, Calif.

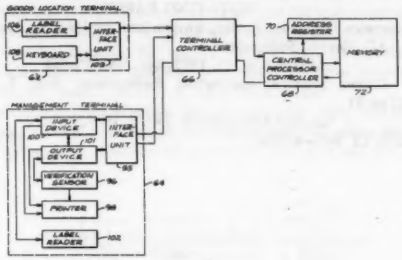
Continuation-in-part of Ser. No. 276,282, Jun. 22, 1981, Pat. No. 4,423,415. This application Jan. 17, 1983, Ser. No. 458,699
Int. Cl.[4] H04Q *9/00;* **G06K** *5/00*
U.S. Cl. 340—825.34 **11 Claims**

1. A machine verification device for use with a specific unit of merchandise, comprising:

a verification tag comprising a medium having a measurable uniqueness characteristic;

identification indicia on said tag;

verification indicia on said tag related to said uniqueness characteristic; and

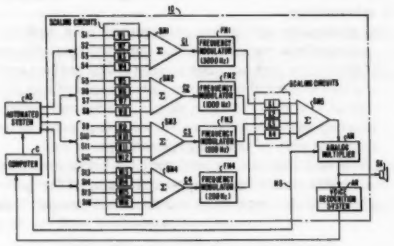


means for affixing said verification tag to said specific unit of merchandise whereby said identification indicia is accessible for sensing or observing.

4,558,319
AUTOMATED SYSTEM MONITORING USING FREQUENCY AND AMPLITUDE MODULATION

Lanson Y. Shum, Wexford, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 7, 1982, Ser. No. 447,568
Int. Cl.[4] G08B *21/00, 19/00;* **G08C** *19/16, 25/02*
U.S. Cl. 340—870.09 **17 Claims**



1. Apparatus for developing an audio signal indicative of the operational status of one or more automated systems such as that used for implementing a process such as assembly, welding, etc., comprising:

a plurality of sensor means for generating time varying monitoring signals indicative of a plurality of time varying operational conditions of said automated systems;

summing means for combining said plurality of monitoring signals and generating a single time varying analog signal;

FM modulator means having a frequency range within the audio range for generating a time varying audio output signal corresponding to said analog signal developed by said summing means;

audio signal responsive means for manifesting said time varying audio output signal as an indication of the operational status of said automated system; and

analog multiplier means for coupling said audio output signal to said audio signal responsive means and means for supplying a modulating signal to said analog multiplier means, such that said analog multiplier means functions as an amplitude modulator, the level of said modulating signal varying in time with the process being performed by said automated system to critically weight predetermined phases of the process with respect to others and correspondingly modify said audio output signal on the basis of the significance of the relative phases of the process being performed by said automated system.

4,558,320

APPARATUS FOR THE CONTACTLESS TRANSMISSION OF DATA OR THE LIKE BETWEEN TWO RELATIVELY ROTATING PARTS

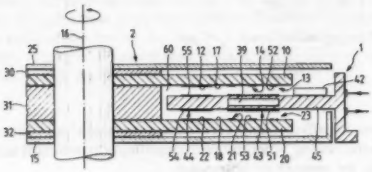
Donatus Pedrazza, Zurich, Switzerland, assignor to Contraves AG, Zurich, Switzerland

Filed Aug. 12, 1982, Ser. No. 407,651

Claims priority, application Switzerland, Sep. 4, 1981, 5714/81

Int. Cl.⁴ G08C *19/06, 19/10, 19/12, 19/16*

U.S. Cl. 340—870.30 **18 Claims**



10. An apparatus for the contactless transmission of electrical signals from a rotatable first component to a stationary second component, comprising:

a rotatable first component possessing two rotatable parts;

a stationary component possessing a stationary part;

each of said two rotatable parts being provided with electrical conductor components and being rotatable about a predetermined axis of rotation;

said two rotatable parts being arranged in mutually spaced relationship;

said stationary part being constructed as a pick-up plate stationarily arranged between said two rotatable parts;

said stationary pick-up plate having a first surface confronting said electrical conductor components of one rotatable part of said two rotatable parts and a second surface confronting said electrical conductor components of another rotatable part of said two rotatable parts; and

each of said first and second surfaces being provided with electrical conductor components arranged for generating a toroidal electrical field and a toroidal magnetic field.

4,558,321

VISITOR CONVERSATION SYSTEM

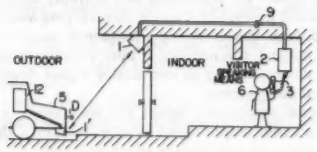
Yoshiyuki Kago, Aichi, and Shigeyuki Akita, Okazaki, both of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed May 9, 1983, Ser. No. 492,827

Claims priority, application Japan, May 10, 1982, 57-77980

Int. Cl.⁴ G08B *7/00*

U.S. Cl. 340—904 **3 Claims**



1. A visitor conversation system comprising:

a transmitter-receiver;

a vehicle carrying communication means for transmitting and receiving ultrasonic speech information signals to and from said transmitter-receiver;

visitor detector means for measuring the distance between said transmitter-receiver and a visitor by receiving reflections from said visitor of ultrasonic waves propagated from said transmitter-receiver and for generating a visitor detection signal when said visitor is within a predetermined detection distance;

a handset provided indoors for generating an audio signal from speech information;

transmitter-receiver means, connected to said transmitter-receiver, for amplitude-modulating said audio signal from said handset to propagate said ultrasonic speech information signals from said transmitter-receiver and for demodulating said ultrasonic speech information signals received by said transmitter-receiver to generate a voice from said handset related to speech information from said communication means;

control means for generating a speech detection signal when said transmitter-receiver receives said ultrasonic speech information signals from said communication means;

change-over switch means for electrically connecting said transmitter-receiver and said visitor detector means when said control means is not generating said speech detection signal and for electrically connecting said transmitter-receiver and said transmitter-receiver means when said control means generates said speech detection signal;

display means, responsive to said visitor detector means and said control means, for performing a first display for indicating a visitor in response to said visitor detection signal and for performing a second display for indicating speech information in response to said speech detection signal;

hook switch means for generating a rest signal when said handset is in a rest position; and

means for ending said second display in said display means when said hook switch means does not generate said rest signal.

4,558,322

RADAR SYSTEM OPERATING BY MEANS OF FREQUENCY MODULATED PULSED WAVES

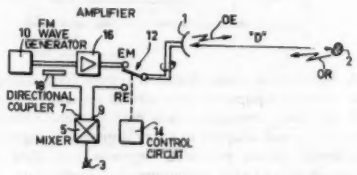
Jean-Pierre Tomasi, Velizy, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 21, 1981, Ser. No. 332,985

Claims priority, application France, Dec. 19, 1980, 80 27041

Int. Cl.⁴ G01S *7/28*

U.S. Cl. 343—17.2 R **2 Claims**



1. In a radar system of the kind operating by means of pulsed frequency modulated waves and comprising an aerial system for directing such waves to at least one target located at a distance D and for receiving the waves reflected from this target, a mixer circuit having a first input for receiving a local signal, a second input for receiving the reflected signal received by the aerial system and an output for producing an information about the distance D, a frequency-modulated wave generator producing an output signal having a periodic linear sweep in frequency, and a change-over device cooperating with a control circuit for (i) temporarily connecting the aerial system to the generator and for thus producing the pulsed frequency-modulated waves while the first input of the mixer circuit receives a signal which is derived from the output signal of the said generator, and (ii) disconnecting the second input of the mixer circuit from the aerial system while the aerial system is connected to the generator; the improvement characterized in that the control circuit comprises means for connecting the aerial system to the output of the frequency-modulated wave generator during one of a plurality of equal

fixed time sub-intervals selected in a pseudo-random manner within each of successive time intervals of equal fixed duration.

4,558,323

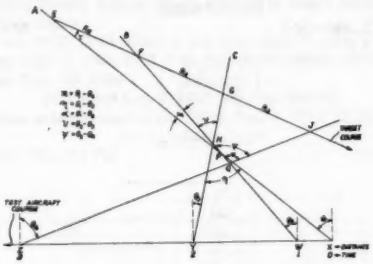
PASSIVE RANGING OF AN AIRBORNE EMITTER BY A SINGLE SENSOR

Martin Golinsky, East Hills, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Continuation of Ser. No. 324,827, Nov. 25, 1981, abandoned. This application Dec. 14, 1984, Ser. No. 681,695

Int. Cl.⁴ G01S *3/02*; G06F *15/58*

U.S. Cl. 343—458 **7 Claims**



1. A method of passively determining, from a test platform, the range and speed of each of at least one moving emitter, comprising:

traveling at a non-constant speed a course in a test platform along a path which is straight and in the same horizontal plane as each of the at least one emitter;

detecting at the platform the presence of a radiant energy signal from each of the at least one moving emitter, the radiant energy signal being selected from continuous and non-continuous signals, said detecting being done at four sites along the path at four predeterminely selected instants of time, said traveling at a non-constant speed a course in the test platform so that the magnitude of displacement between each of the four sites are unequal and a unique trajectory of each of the at least one moving emitter can be defined simultaneously;

generating a detection signal responsive to the angle of arrival of each of the energy signals, each of the angles of arrival of the energy signals detected along the path being measured with respect to a predeterminely selected reference direction;

generating a position signal derived from the position of the test platform at each predeterminely selected instant of time of said detecting of the energy signal;

storing the detection signals and the position signals;

determining the course range and speed of each of the at least one moving emitter by substituting into geometric relationships the values of the stored signals at the four predeterminely selected instants of time; and

generating a target indication signal representative of the course range and speed of each of the at least one moving emitter.

4,558,324

MULTIBEAM LENS ANTENNAS

Roger E. Clapp, Cambridge, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

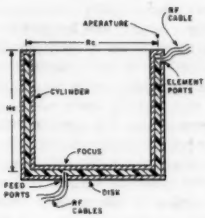
Filed Jul. 7, 1983, Ser. No. 511,591

Int. Cl.⁴ H01Q *15/02*

U.S. Cl. 343—754 **18 Claims**

1. A multibeam lens antenna unit in which a lens structure comprises closely spaced conductive plates with a dielectric medium between the plates, an aperture which is at least part of a circle along an edge of the lens structure, an antenna array comprising a plurality of array elements, arranged in a circular arc, a plurality of transmission lines coupling the array elements individually to element ports along the aperture for coupling RF energy between the array and the lens structure, a plurality of feed ports coupling the lens structure to transmission lines for coupling RF energy between the lens structure and radio equipment, each feed port being at a focus point for a particular beam direction at the antenna array;

the improvement wherein the lens structure comprises first and second portions, in the first portion the plates being surfaces of revolution about an axis, with first and second



ends thereof being circles in planes perpendicular to the axis, the first end being said aperture; the second portion forming a cap with a circular periphery joined to the first portion at its second end; the dielectric constant and therefore the index of refraction being constant within each portion;

wherein the first portion and the second portion have different dielectric constants, the height of the first portion, the radius, the two dielectric constants, and other parameters being such that the focus for any beam falls on the periphery of the second portion.

4,558,325

BI-AXIAL SUPPORTING ARRANGEMENT WHICH CAN WITHSTAND HIGH ACCELERATION FORCES

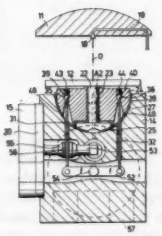
Johan P. Ström, Järfälla, Sweden, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 12, 1982, Ser. No. 441,184

Claims priority, application Sweden, Nov. 13, 1981, 8106754

Int. Cl.⁴ H01Q *3/08*

U.S. Cl. 343—765 **8 Claims**



1. An arrangement for bi-axial tiltable support of a load rotor in a projectile having a rotor housing, said arrangement upon firing of the projectile being exposed to large acceleration forces, said arrangement including means to allow said rotor to perform limited tilting or turning motions about two mutually perpendicular tilt axes lying in a plane, the tilt axes being substantially perpendicular to the longitudinal axis of the projectile, the rotation axis of the rotor substantially coinciding with the longitudinal axis of the projectile, said rotor being supported by a bearing body having at least a spherical section

contour, said bearing body being disposed in a correspondingly spherically cup-shaped recess in a stationary part, said recess having an open end, said rotor being mounted on the bearing body and disposed in the recess, said rotor facing toward the motion direction of the projectile and having the bottom thereof oppositely disposed, said arrangement including means that at firing establish contact momentarily between the spherical surfaces of the recess and the bearing body, and said bearing body being connected with the projectile housing via two pairs of link arms elongated in the longitudinal direction of the projectile, each pair of link arms including first and second link arms each having first and second ends, said first end of each link arm in each pair being rotatably joined to said bearing body at two diametrically spaced points of said bearing body for defining a turning axis for said bearing body between said points, said link arms in each pair having said second ends thereof joined by motion transmitting means to a respective output shaft in such manner that rotation of the shaft is transferred to said bearing body and vice versa by longitudinal displacement of said link arms, a drive motor and an angular transducer being mounted on each shaft, and said arrangement including means for delivering compressed air to the space between the spherical surface of the bearing body and the spherical surface of the recess in order to maintain, in operation, a small gap between the said surfaces for allowing said tilting motions of the bearing body.

4,558,326

PURGING SYSTEM FOR INK JET RECORDING APPARATUS

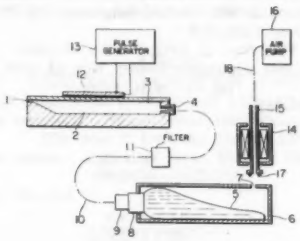
Yoshiaki Kimura, Hachioji, and Yasuhiko Tanaka, Kodaira, both of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Sep. 6, 1983, Ser. No. 529,611

Claims priority, application Japan, Sep. 7, 1982, 57-156085; Sep. 13, 1982, 57-160700; Sep. 21, 1982, 57-165270; Sep. 29, 1982, 57-171120; Sep. 29, 1982, 57-171121; Sep. 29, 1982, 57-171122

Int. Cl.[4] G01D *9/00, 15/16*

U.S. Cl. 346—1.1 **14 Claims**



1. In a method for ink jet recording which uses an ink jet recording apparatus comprising an ink-on-demand-type recording head which jets recording ink through nozzles thereof to make recordings, said recording ink being forcibly sent from a pressure chamber to said nozzles; an ink cartridge comprised of an ink container bag filled with said recording ink and having a yieldable portion; and an ink cartridge body which houses said ink container bag, said ink cartridge body having at least one opening therein,

said method comprising a purging step including:

selectively forcibly conducting a gas during a non-recording period by a gas pressurizing means through said at least one opening of said ink cartridge body and into said ink cartridge body to thereby increase the pressure inside said ink cartridge body to cause said yieldable portion of said ink container bag to yield to pressurize said ink inside said ink container bag so that the pressurized ink flows into said recording head to thereby purge said recording head from bubbles or the like along with the ink thereinside; and

selectively opening said at least one opening of said ink cartridge body to the atmosphere to prevent a purging operation of said recording head.

4,558,327

MAGNETIC COPYING METHOD AND APPARATUS

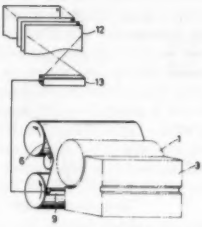
Koichi Saitoh; Kiyoshi Horie; Teruhiko Itami, and Toshifumu Kimoto, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Nov. 21, 1983, Ser. No. 553,917

Claims priority, application Japan, Nov. 19, 1982, 57-201865

Int. Cl.[4] G01D *15/34*

U.S. Cl. 346—74.2 **22 Claims**



1. A magnetic copying method, comprising the steps of:

(a) forming master magnetic latent images from originals consisting of plural pages onto a magnetic image memory bearer;

(b) transferring at least one of said master latent images onto a magnetic recording means and forming a slave latent image corresponding to said at least one of said master latent images on said magnetic recording means;

(c) developing said slave latent image with toner;

(d) transferring said toner image onto a transfer sheet;

(e) fixing said toner image on said transfer sheet;

(f) erasing said slave latent image on said recording means;

(g) repeating said steps from (b) to (f) until the remaining master latent images have been copied to obtain a set of copies;

(h) repeating said steps from (b) to (g) until a number of required sets of copies have been obtained.

4,558,328

HIGH RESOLUTION THERMAL INK TRANSFER PRINTER

Itsuo Takanashi; Hideshi Tanaka; Hisanori Tsumiyama, all of Yokohama; Yoshio Mizuno, Kamakura; Terumi Ohara, Yokohama; Shigeru Kato, Tokyo; Toshinori Takahasi, Kawasaki, and Tsutomu Kiuchi, Yokohama, all of Japan, assignors to Victor Company of Japan, Ltd., Japan

Filed Oct. 25, 1983, Ser. No. 545,298

Claims priority, application Japan, Oct. 26, 1982, 57-186721; Dec. 17, 1982, 57-220134

Int. Cl.[4] G01D *15/10*

U.S. Cl. 346—76 PH **7 Claims**

1. A printer for providing a print on a record medium by transfer of thermally fusable ink from a transfer medium to said record medium, comprising a thermal print head including a

linear array of resistance elements corresponding to picture elements to be printed along a line path on said record medium, means for continuously and relatively moving said head and both of said mediums to each other at a substantially constant speed in a direction perpendicular to said line path and providing a pressure contact between said head and transfer medium and between said transfer and record mediums, and head control means for generating a current of constant intensity in each of said resistance elements for a duration proportional to a tone value of each of said picture elements.

4,558,329

INK CARRIER RIBBON FOR SUBLIMATION TRANSFER

Sigemichi Honda, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

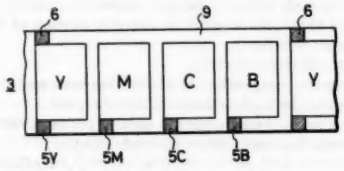
PCT No. PCT/JP83/00302, § 371 Date May 7, 1984, § 102(e) Date May 7, 1984, PCT Pub. No. WO84/00927, PCT Pub. Date Mar. 15, 1984

PCT Filed Sep. 9, 1983, Ser. No. 609,081

Claims priority, application Japan, Sep. 9, 1982, 57-156980

Int. Cl.⁴ B41J *35/16*

U.S. Cl. 346—76 PH **7 Claims**



1. An ink carrier ribbon for sublimation transfer type hard copying comprising:

a base;

a plurality of thermally transferable ink portions formed on said base with a predetermined arrangement; and

a position detecting mark for said ink portions adjoining at least a portion of said plurality of ink portions,

at least one of said ink portions and said position detecting mark being formed of ink compositions identical with each other,

said ink compositions being composed of a dispersion dye, a binder, and a pigment having thermally stable characteristics and an absorbing property for infrared rays.

4,558,330

THERMAL PRINTING HEAD

Jiro Iizuka, Tokyo; Takatoshi Kaneko, Machida, and Tooru Hashiba, Tokyo, all of Japan, assignors to Victor Company of Japan, Ltd., Japan

Filed Nov. 13, 1984, Ser. No. 670,807

Claims priority, application Japan, Nov. 14, 1983, 58-212424

Int. Cl.⁴ B41J *3/20*

U.S. Cl. 346—76 PH **10 Claims**

1. A thermal printing head comprising first through n-th heating elements for printing, where n is a natural number greater than one, a k-th heating element among said first through n-th heating elements having an area of M/2 when a total area of one picture element is represented by M, where each of k and i is a natural number which is selected from among one through n so that respective areas of said first through n-th heating elements are different from each other said first through n-th heating elements being arranged substantially along a printing line at such positions that the areas of said first through n-th heating elements correspond to different picture element parts of one picture element in the printing line which is to be printed, said different picture element parts of said one picture element not overlapping with each other.

4,558,331

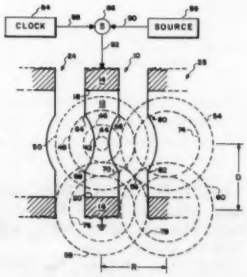
HEATING RESISTOR SHAPE IN A THERMAL PRINTHEAD

William M. Adkisson, Englewood, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Filed May 7, 1984, Ser. No. 607,986

Int. Cl.⁴ G01D *15/10*

U.S. Cl. 346—76 PH **15 Claims**



1. A thermal recording head for use in marking a thermally responsive recording medium proximate thereto, comprising:

a heater member of resistive material;

first and second electrical conductors connected at first and second locations, respectively, to said heater member to apply electrical energy thereto, said resistive material having a first cross-sectional area at a first position between the first and second locations and cross-sectional areas in other positions between the first and second locations that increase with remoteness from the first position so that when electrical energy is applied, the first position reaches a first temperature at a first time and progressively remote positions reach the first temperature at progressively later times.

4,558,332

INK JET PRINTER

Hiroshi Takahashi, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 18, 1983, Ser. No. 476,480

Claims priority, application Japan, Apr. 2, 1982, 57-53750[U]; Apr. 2, 1982, 57-53751[U]

Int. Cl.⁴ G01D *15/18*

U.S. Cl. 346—140 R **9 Claims**

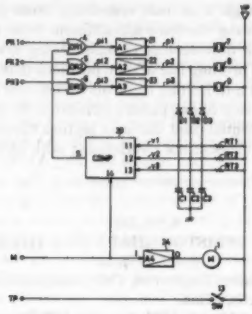
1. An ink jet printer comprising:

a plurality of nozzle means for ejecting ink droplets when said nozzle means are driven;

drive means for providing a plurality of output signals, each output signal being provided for independently driving a respective one of said plurality of nozzle means;

detection means for providing a detection signal when said

drive means has failed to provide any one output signal for a predetermined time period; and



scavenge means for providing a scavenge signal to drive all of said nozzle means in response to the detection signal.

4,558,333

LIQUID JET RECORDING HEAD

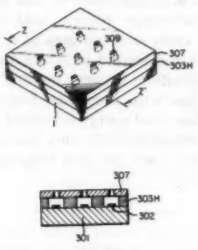
Hiroshi Sugitani, Machida; Hiroto Matsuda, Yokohama, and Masami Ikeda, Machida, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 2, 1982, Ser. No. 394,787

Claims priority, application Japan, Jul. 9, 1981, 56-107414; Jul. 9, 1981, 56-107415; Jul. 9, 1981, 56-107416; Jul. 9, 1981, 56-107417

Int. Cl.[4] G01D *15/18*

U.S. Cl. 346—140 R **14 Claims**



1. A liquid jet recording head, comprising a substrate, a hardened photosensitive material on such substrate defining a plurality of liquid pathways, said hardened photosensitive material constituting the side walls of said liquid pathways, a plurality of energy generating elements disposed on said substrate with one said energy generating element for each of said liquid pathways, and a plate having formed therein a plurality of discharging orifices, with one said discharging orifice for each of said liquid pathways for discharging liquid from the corresponding said liquid pathway, wherein said energy generating elements are disposed to expel liquid through said orifices in a direction substantially perpendicular to the surface of said substrate, and wherein said substrate, said hardened photosensitive film and said plate are laminated together in that order.

4,558,334

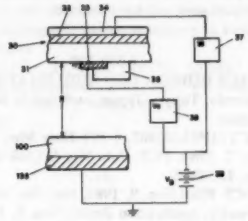
ELECTROSTATIC IMAGING DEVICE

Richard A. Fotland, 220 Chamberlain St., Holliston, Mass. 01746

Filed Jun. 6, 1983, Ser. No. 501,453

Int. Cl.[4] G01D *15/06*

U.S. Cl. 346—159 **21 Claims**



1. Electrostatic imaging apparatus comprising:

a solid dielectric member;

a first electrode adjacent the solid dielectric member;

a second electrode adjacent an opposite portion of the solid dielectric member;

a further electrode member;

a first time-varying potential applied between said first electrode and the further electrode member; and

a second time-varying potential applied between said second electrode and said further electrode member,

wherein the first and second time-varying potentials provide a potential difference between the first and second electrodes to selectively generate ions in a region adjacent the first electrode and the solid dielectric member, and wherein ions are extracted from said region in response to said first potential to form an electrostatic image.

4,558,335

THERMORESPONSIVE RECORDING SHEET

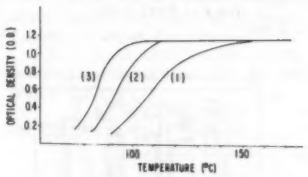
Naoki Hanayama, Oita; Eisaburo Kaku, Shiga, and Ryoichi Kinishi, Nara, all of Japan, assignors to Yoshitomi Pharmaceutical Industries, Ltd., Osaka, Japan

Filed Mar. 11, 1982, Ser. No. 357,113

Claims priority, application Japan, Mar. 11, 1981, 56-35619

Int. Cl.[4] B41M *5/18*

U.S. Cl. 346—209 **6 Claims**



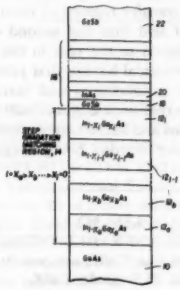
1. A thermoresponsive recording paper sheet comprising a paper substrate and a thermoresponsive recording layer on said substrate, wherein said thermoresponsive recording layer comprises at least one normally colorless or pale-colored chromogenic substance in combination with at least one phenolic compound and benzyl 4-benzyl-oxybenzoate as a responsiveness-increasing agent.

4,558,336

MBE GROWTH TECHNIQUE FOR MATCHING SUPERLATTICES GROWN ON GAAS SUBSTRATES

Chin-An Chang, Peekskill; Leroy L. Chang, Goldens Bridge, and Leo Esaki, Chappaqua, all of N.Y., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 2, 1984, Ser. No. 585,718
Int. Cl.[4] H01L *27/12*
U.S. Cl. 357—4 4 Claims



1. A multilayer semiconductor device whereby lattice mismatch between first and second layers is overcome, comprising the improvement of:

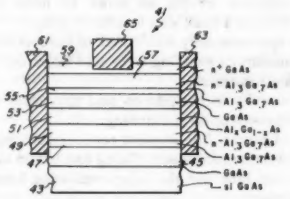
a plurality of successive intermediate semiconductor layers between said first and second layers, said intermediate layers being of predetermined thicknesses and having respective compositions which vary in discrete graded steps of semiconductor composition from a composition which substantially matches the lattice parameters of the first layer to a composition which substantially matches the lattice parameters of the second layer.

4,558,337

MULTIPLE HIGH ELECTRON MOBILITY TRANSISTOR STRUCTURES WITHOUT INVERTED HETEROJUNCTIONS

Paul Saunier, Garland, and Hung-Dah Shih, Plano, both of Tex., assignors to Texas Instruments Inc., Dallas, Tex.

Filed May 30, 1984, Ser. No. 615,978
Int. Cl.[4] H01L *29/80, 29/205*
U.S. Cl. 357—22 12 Claims



1. A channel for a high electron mobility transistor, comprising:

(a) two heterojunction structures, each of said heterojunction structures characterized by a layer of a first semiconductor material formed on a layer of a second semiconductor material;

(b) a connecting layer between said structures, a first surface of said connecting layer formed abutting said layer of said first material of a first of said structures, the second surface of said connecting layer formed abutting said layer of said second material of the second of said structures; and

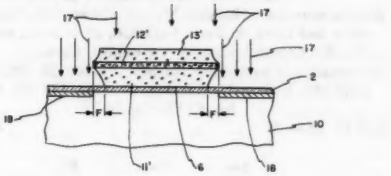
(c) said connecting layer characterized by semiconductor material which is graded from said first surface to said second surface, which at said first surface is substantially the same as said first semiconductor material, and which at said second surface is substantially the same as said second semiconductor material.

4,558,338

INSULATED GATE TYPE FIELD EFFECT TRANSISTOR HAVING A SILICON GATE ELECTRODE

Masanori Sakata, Tokyo, Japan, assignor to Nec Corporation, Tokyo, Japan

Filed Aug. 15, 1983, Ser. No. 523,656
Claims priority, application Japan, Aug. 19, 1982, 57-144491
Int. Cl.[4] H01L *29/04, 29/78*
U.S. Cl. 357—23.9 4 Claims



1. An insulated gate type field effect transistor comprising a semiconductor substrate having a semiconductor region of one conductivity type, at least one of source and drain regions of the opposite conductivity formed in said semiconductor region, a channel region abutted against said one of said source and drain regions and extending in its lengthwise direction in said semiconductor region, a gate insulating film formed on said channel region, and a gate electrode formed on said gate insulating film, said gate electrode including a lower layer of polycrystalline silicon attached to said gate insulating film at its bottom surface and being substantially free from silicon dioxide particles, an inner layer of polycrystalline silicon provided on said lower layer and containing silicon dioxide particles therein, and an upper layer of polycrystalline silicon provided on said inner layer, being substantially free from silicon dioxide particles and having an upper surface,

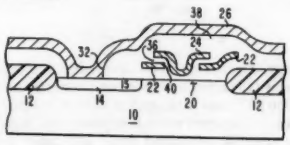
a length of said inner layer in said lengthwise direction of said channel region being larger than that of said lower layer at said bottom surface of said lower layer.

4,558,339

ELECTRICALLY ALTERABLE, NONVOLATILE FLOATING GATE MEMORY DEVICE

Rodney L. Angle, Millstone, N.J., assignor to RCA Corporation, Princeton, N.J.

Continuation of Ser. No. 437,271, Oct. 18, 1982, abandoned.
This application May 7, 1984, Ser. No. 607,716
Claims priority, application United Kingdom, Mar. 9, 1982, 8206908
The portion of the term of this patent subsequent to Nov. 22, 2000, has been disclaimed.
Int. Cl.[4] H01L *29/78, 27/02, 29/04;* G11C *11/40*
U.S. Cl. 357—23.5 8 Claims



7. A floating gate memory device comprising:

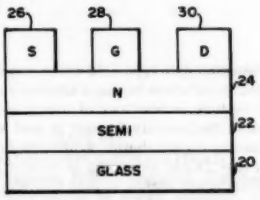
A substrate of a first conductivity type;
source and drain regions, of a second conductivity type, formed in the substrate at the surface thereof;
a channel region formed between the source and drain regions;
a first level conductive layer adjacent to and insulated from the substrate and positioned over the channel region;
a second level conductive floating gate layer positioned over the first conductive layer on a side remote from the substrate and insulated from the first conductive layer; and
an opening, formed in the first level conductive layer and completely surrounded thereby, through which the second level conductive floating gate layer projects in order to couple to the substrate.

4,558,340

THIN FILM FIELD EFFECT TRANSISTORS UTILIZING A POLYPNICTIDE SEMICONDUCTOR

Rozalie Schachter, Flushing; Marcello Viscogliosi, North Tarrytown, and Lewis A. Bunz, Peekskill, all of N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Continuation-in-part of Ser. No. 509,175, Jun. 29, 1983, Pat. No. 4,509,066. This application Jun. 11, 1984, Ser. No. 619,053
Int. Cl.⁴ H01L *29/78*
U.S. Cl. 357—23.7 **41 Claims**



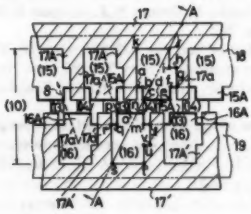
1. A thin film transistor comprising, as a switched semiconductor portion thereof, a thin film of MP_X where M is at least one alkali metal, P is at least one pnictide, and x ranges substantively between 15 and infinity.

4,558,341

CHARGE TRANSFER WITH MEANDER CHANNEL

Tadakuni Narabu, Atsugi, and Miaki Nakashio, Machida, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Apr. 19, 1983, Ser. No. 486,309
Claims priority, application Japan, Apr. 22, 1982, 57-67890
Int. Cl.⁴ H01L *27/78*; G11C *19/28*
U.S. Cl. 357—24 **1 Claim**



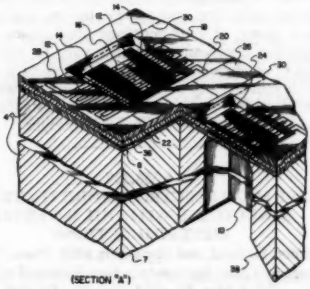
1. A charge transfer device comprising a plurality of first storage regions (15) separated from one other by a first channel stopper region (17) and arranged in a first longitudinal direction, a plurality of second storage regions (16) opposed to said first storage regions, separated from one other by a second channel stopper region (17') and arranged along said one direction, and first and second transfer regions (13, 14) placed between said first and second storage regions and arranged alternately along said one direction, wherein said first and second storage regions are displaced from one other with respect to said one direction, said first and second transfer regions adjoining along said one direction are paired, each of said pairs is in common contact with said first storage regions and is in respective contact with said separated and adjoining second storage regions, said first and second storage regions having first portions which extend transversely to said first direction a distance greater than other portions of said first and second storage regions and said first portions of said first and second storage regions being longitudinally offset from each other, to said first and second transfer regions to form protrusive portions, and portions of said first and second channel stopper regions which correspond to the rear in the charge transfer direction being asymmetrical having first portions in the rear thereof which extend transverse to said first direction a distance greater than the rear back edges of said first and second channel stopper regions and said first portions of said first and second channel stopper regions being longitudinally offset from each other.

4,558,342

THERMOELECTRIC INFRARED DETECTOR ARRAY

Nathan Sclar, Diamond Bar, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed May 31, 1983, Ser. No. 499,658
Int. Cl.⁴ H01L *35/32*
U.S. Cl. 357—30 **1 Claim**



1. A thermoelectric infrared detector array comprising:
a silicon substrate having an array of holes extending through it from a back side to a front side;
a thin layer approximately 300Å thick of unsupported silicon dioxide insulator extending over said holes on said front side of said substrate;
p-n junctions of a thermopile on said thin layer over said holes, said thermopile comprising:
a plurality of p-type, line element semiconductors, one end of each p-type semiconductor being located on said insulator over said hole and the other end being located over said substrate;
a plurality of n-type, line element semiconductors, one end of each of n-type semiconductor being located on said insulator over said hole and the other end being located over said substrate;
said one end of said p- and n-type semiconductors being coupled together to form said p-n junctions of said thermopile and said other ends of said p- and n-type semiconductors being coupled together to place said p-n junctions in series;
a second thin layer of insulator covering said plurality of p- and n-type semiconductors;
an infrared absorbing material covering a portion of said second thin layer of insulator over said hole but separated

by a space from the edge of said substrate, said line elements having a first width under said absorbing material and a narrower second width in said space between said absorbing material and said substrate;

said detector array including processing integrated circuits on said front side of said substrate, said processing electronics being coupled to the output of each thermopile, whereby the individual output from each detector can be processed to provide a signal output from said array.

4,558,343

SEMICONDUCTOR DEVICE HAVING A HIGH RESISTIVITY LAYER IN DIRECT CONTACT WITH A POLYCRYSTALLINE SILICON LAYER OF HIGH IMPURITY CONCENTRATION

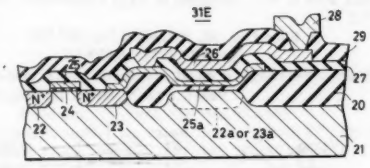
Syoji Ariizumi, Tokyo; Yasushi Fukatsu, and Fujio Masuoka, both of Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 438,580, Nov. 2, 1982, abandoned, which is a continuation of Ser. No. 121,451, Feb. 14, 1980, abandoned. This application Oct. 26, 1984, Ser. No. 665,081

Claims priority, application Japan, Feb. 20, 1979, 54-18734; Jun. 27, 1979, 54-81126; Nov. 30, 1979, 54-155410

Int. Cl.⁴ H01L *27/02, 29/34, 29/04*

U.S. Cl. 357—51 **6 Claims**



1. In a semiconductor device having a first MOS transistor and a second MOS transistor separated by a field oxide layer from the first MOS transistor, a structure comprising:

a semiconductor substrate of one conductivity type;

a high impurity concentration diffusion region formed in the surface of said semiconductor substrate and doped with an impurity of the opposite conductivity type to that of said substrate, said region being the drain diffusion region of said first MOS transistor;

a first polycrystalline silicon layer doped with an impurity of said opposite conductivity type and extending over said field oxide layer, and one end of which is connected with a portion of said high impurity concentration diffusion region;

an oxide layer extending over a portion of said first polycrystalline silicon layer;

a resistor comprising a second polycrystalline silicon layer disposed over either one of the gate electrodes of the first and second MOS transistors, one end of said resistor being in direct contact with said first polycrystalline silicon layer through an opening provided over the field oxide layer through said oxide layer, and impurities being thermally diffused from said first polycrystalline silicon layer into that portion of said second polycrystalline silicon layer which is in contact with said first polycrystalline silicon layer, thereby electrically connecting both the first and second polycrystalline silicon layers; and

another end portion of said first polycrystalline silicon layer constituting a gate electrode of the gate of said second MOS transistor.

4,558,344

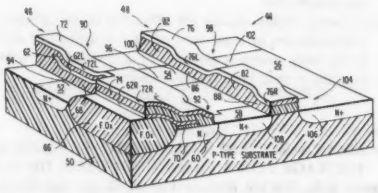
ELECTRICALLY-PROGRAMMABLE AND ELECTRICALLY-ERASABLE MOS MEMORY DEVICE

George Perlegos, Fremont, Calif., assignor to Seeq Technology, Inc., San Jose, Calif.

Filed Jan. 29, 1982, Ser. No. 343,847

Int. Cl.⁴ H01L *29/04, 29/78;* **G11C** *11/34*

U.S. Cl. 357—59 **10 Claims**



1. An MOS memory cell fabricated on a substrate of first conductivity-type material, said MOS memory cell comprising:

an electrically-programmable and electrically-erasable storage device including first and second diffusions of a second conductivity-type material formed in the substrate and spaced-apart from one another, a third diffusion of a second conductivity-type material formed in the substrate and physically isolated from said first and second diffusions, and a floating gate structure disposed on the surface of the substrate above said first, second and third diffusions such that charge carriers can be transported between said floating gate structure and said third diffusion in response to the capacitive coupling of said floating gate structure and said third diffusion while the presence or absence of charge carriers in said floating gate structure is determined by sensing current flow between said first and second diffusions in response to voltage potentials applied thereto; and

a selection means for electrically connecting said first and third diffusions, said selection means including a fourth diffusion of second conductivity-type material formed in the substrate and a first transistor means for establishing a conductive path between said fourth diffusion and said second diffusion, said selection means also including a second transistor means for establishing a conductive path between said fourth diffusion and said third diffusion such that the full value of any potential applied to said fourth diffusion is transferred in its entirety to said third diffusion.

4,558,345

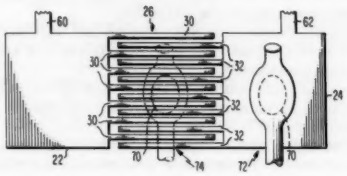
MULTIPLE CONNECTION BOND PAD FOR AN INTEGRATED CIRCUIT DEVICE AND METHOD OF MAKING SAME

Robert A. Dwyer, and James E. Gillberg, both of Hunterdon, N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Oct. 27, 1983, Ser. No. 546,181

Int. Cl.⁴ H01L *23/12, 25/52*

U.S. Cl. 357—68 **14 Claims**



1. An integrated circuit device having formed thereon:

(a) an integrated circuit selectively capable of operating in any of a plurality of modes of operation;

(b) a plurality of conductor paths arranged within and electrically connected to said integrated circuit so that when said conductor paths are electrically separate said integrated circuit is operable in one of said plurality of modes of operation and when two or more of said plurality of conductor paths are electrically connected said integrated circuit is operable in another of said plurality of modes of operation; and

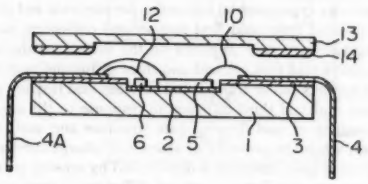
(c) a bond region means for effecting an electrical connection between at least two of said plurality of conductor paths only when a portion of a conducting material is bonded to said bond region means.

4,558,346

HIGHLY RELIABLE HERMETICALLY SEALED PACKAGE FOR A SEMICONDUCTOR DEVICE

Susumu Kida, Tokyo; Hayato Usami, Inagi, and Hideji Aoki, Machida, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 23, 1983, Ser. No. 477,934
Claims priority, application Japan, Mar. 29, 1982, 57-050734
Int. Cl.⁴ H01L *21/60*; H05K *1/09*
U.S. Cl. 357—74 **7 Claims**



4. A terminal connected to an integrated circuit device comprising:

a metal base having first and second surfaces;

an upper coating layer, formed on said first surface of said metal base, of a metal selected from the group consisting of aluminum and an aluminum silicon alloy; and

a lower coating layer, formed on said second surface of said metal base and operatively connected to the integrated circuit device, of a gold-silicon type of alloy.

4,558,347

PROGRESSIVE SCAN TELEVISION SYSTEM EMPLOYING VERTICAL DETAIL ENHANCEMENT

Dalton H. Pritchard, and Walter E. Sepp, both of Princeton, N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Aug. 26, 1983, Ser. No. 526,702
Int. Cl.⁴ H04N *5/02*
U.S. Cl. 358—11 **37 Claims**

18. A color television system for producing a progressively scanned image, comprising:

a source of television signals representing luminance and chrominance information of an image raster-scanned at a first rate in an interlaced fashion;

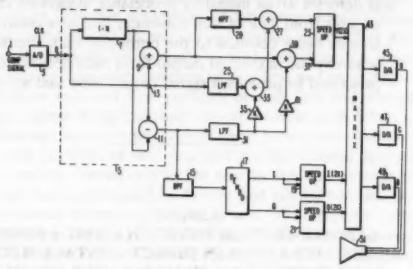
separating means coupled to receive said television signals, for separating said television signals into first and second signal components;

first signal path, coupled to receive said first signal component, for generating said luminance information at twice said first rate;

second signal path, coupled to receive said second signal component, for generating said chrominance information at twice said first rate;

detail means, coupled to receive signals including vertical detail information in said television signals, for recovering spectral components of the vertical detail in such luminance information;

combining means, coupled in said first signal path, for combining said spectral components of said vertical detail with



at least a portion of said luminance information to form an improved luminance signal;

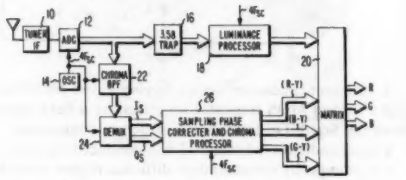
display means, coupled to receive signals from said first and second signal paths, for displaying lines of video from said first and second path by progressive scanning.

4,558,348

DIGITAL VIDEO SIGNAL PROCESSING SYSTEM USING ASYNCHRONOUS A-TO-D ENCODING

Thomas V. Bolger, Merchantville, and Robert L. Libbey, Cherry Hill, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Dec. 30, 1983, Ser. No. 567,190
Int. Cl.⁴ H04N *9/50*
U.S. Cl. 358—13 **10 Claims**



1. Apparatus for digitally processing a composite video signal including a luminance component, and a chrominance component in the form of an amplitude and phase modulated subcarrier, and including a color reference burst interval, comprising:

a source of analog composite video signal;

a free running oscillator for generating clocking signals;

an analog-to-digital converter coupled to said source for generating digital representations of the analog signals at instants determined by said clocking signals.

4,558,349

COLOR SUBCARRIER GENERATOR

Tadao Sasaki, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

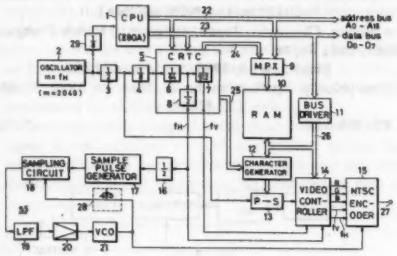
Filed Dec. 23, 1982, Ser. No. 452,756
Claims priority, application Japan, Dec. 25, 1981, 56-211257
Int. Cl.⁴ H04N *9/44*
U.S. Cl. 358—16 **22 Claims**

1. In a system for converting data representing color displays into a composite color video signal suitable for display by a visual display apparatus, the combination comprising:

oscillating means for generating a system clock signal with a predetermined frequency;

frequency dividing means responsive to said system clock signal from said oscillating means for generating horizontal and vertical sync signals and a dot clock signal;

means responsive to said horizontal and vertical sync signals for timing horizontal and vertical scan of said visual display apparatus;



means responsive to said dot clock signal for timing sequential dots of the horizontal lines of the composite color video signal into which said data is converted;

subcarrier generating means responsive to and synchronized in phase with said horizontal sync signal for generating a color subcarrier signal; and

means responsive to said color subcarrier signal for forming the composite color video signal.

4,558,350
VECTOR QUANTIZER

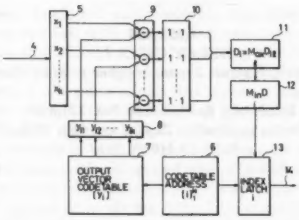
Tokumichi Murakami, Kanagawa, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 13, 1983, Ser. No. 503,473

Claims priority, application Japan, Jun. 11, 1982, 57-100515; Jun. 14, 1982, 57-101704; Jun. 28, 1982, 57-111155; Feb. 15, 1983, 58-23014

Int. Cl.⁴ H04N *9/32*

U.S. Cl. 358—21 R **7 Claims**



1. A vector quantizer for processing color video signals, comprising; an input vector register for receiving an input vector X composed of a block of K (K being more than one) samples including at least two color video signals from each of three channels; an output vector code table memory for particitioning a signal space S^k of said input vector into subspaces having minimum distorted partition and which stores a set of the representative points of said subspaces produced as output vectors; a mini-max arithmeticoperator that detects an output vector which, as a result of mini-max approximation, has been found to be the least distorted from the input vector from among the output vectors successively read from said codetable memory; a coder for encoding the address of said least distorted output vector in said codetable and for delivering the coded address as an output signal; a decoder for reading a corresponding output vector from a decoding output vector code memory using said coded output signal as an address signal; and an output vector decomposing register that decomposes the output vector from said decoder into three channels of output signal sequence.

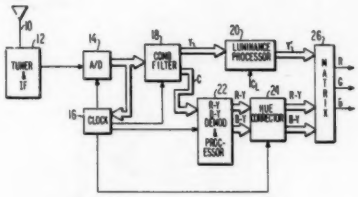
4,558,351
HUE CORRECTION CIRCUIT FOR A DIGITAL TV RECEIVER

Russell T. Fling, Noblesville, and Donald H. Willis, Indianapolis, both of Ind., assignors to RCA Corporation, Princeton, N.J.

Filed Nov. 21, 1983, Ser. No. 554,083

Int. Cl.⁴ H04N *9/535*

U.S. Cl. 358—28 **14 Claims**



1. In a digital video signal processing apparatus including a source of first and second binary color mixture signals, the vector sum of which contains hue information; apparatus for adjusting the hue by vector rotation, comprising:

means coupled to said source for passing only the magnitudes of said first and second binary color mixture signals;

a binary divider having a dividend input port, a divisor input port and a quotient output port;

means coupled to the means for passing the magnitudes of the first and second color mixture signals for applying the larger of said signal magnitudes to one of the dividend and divisor input ports and applying the smaller of said signal magnitudes to the other of said dividend and divisor input ports; the quotients produced by said divider being constrained to correspond to tangents of angles over the range of 0–45 degrees defined by the ratio of the magnitudes of said color mixture signals;

means responsive to the magnitudes of said first and second color mixture signals for generating a control signal having first and second states for the magnitude of said first color mixture signal being respectively greater and smaller than said second color mixture signal;

means, responsive to said quotients, said control signal and the polarity of at least one of said first and second color mixture signals from said source, for generating first and second vector correction factors;

means including means for multiplying said first and second color mixture signals from said source by said first and second correction factors; and

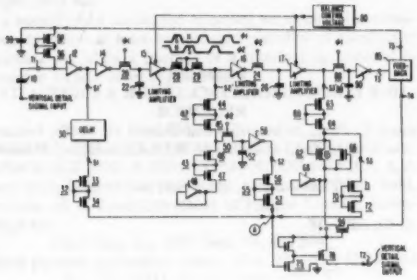
means for combining the products of the first color mixture signal times the first correction factor and the second color mixture signal times the second correction factor to form a hue-corrected first color mixture signal and for combining the product of the second color mixture signal times the first correction factor and the first color mixture signal times the second correction factor to form a hue corrected second color mixture signal.

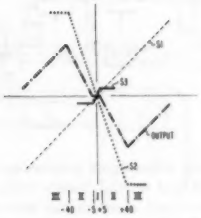
4,558,352

SAMPLED DATA VERTICAL DETAIL SIGNAL PROCESSOR

Donald J. Sauer, Plainsboro Township, Middlesex County, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Nov. 28, 1983, Ser. No. 555,588
Int. Cl.[4] H04N *5/213, 9/78*
U.S. Cl. 358—31 **9 Claims**





1. Video signal processing apparatus comprising:

a source of video signals exhibiting small signal amplitudes over a first range, moderate signal amplitudes over a second range beyond said first range, and large signal amplitudes over a third range beyond said second range;

a first signal channel for conveying a linear version of video signals from said source with a given signal gain;

a second signal channel for conveying video signals from said source with a given signal gain, said second channel including

a first keyed sample and hold circuit coupled to said source and exhibiting (a) a sampling state during a first interval for obtaining a video signal amplitude sample, and (b) a holding state during a succeeding second interval; and

a first amplifier responsive to output signals from said first sample and hold circuit and exhibiting linear and limiting regions, said first amplifier exhibiting a linear region over said first and second amplitude ranges, and a limiting region over said third amplitude range;

a third signal channel for conveying video signals from said source with a given signal gain, said third channel including

a second keyed sample and hold circuit coupled to an output of said first amplifier and exhibiting (a) a holding state during said first interval and (b) a sampling state during said second interval for sampling output signals from said first amplifier; and

a second amplifier responsive to output signals from said second sample and hold circuit and exhibiting linear and limiting regions, said second amplifier exhibiting a linear region over said first amplitude range, and a limiting region over said second and third amplitude ranges; and

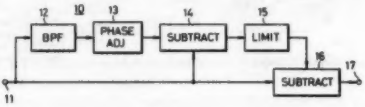
means for combining output signals from said first, second and third channels to produce an output video signal wherein small amplitude components of said output video signal from said combining means are provided with a first gain; and moderate amplitude components of said output video signal are provided with a second gain greater than said first gain.

4,558,353

CIRCUIT FOR REDUCING NOISE IN A CARRIER CHROMINANCE SIGNAL

Akira Hirota, Chigasaki, Japan, assignor to Victor Company of Japan, Ltd., Japan

Filed Mar. 8, 1983, Ser. No. 472,884
Claims priority, application Japan, Mar. 15, 1982, 57-40497
Int. Cl.[4] H04N *9/535*
U.S. Cl. 358—36 **7 Claims**



1. A noise reducing circuit for reducing noise in a carrier chrominance signal comprising:

bandpass filter means supplied with an input carrier chrominance signal, said bandpass filter means having a narrowband pass band of a center frequency equal to a chrominance subcarrier frequency of said input carrier chrominance signal;

a first subtracting circuit supplied with said input carrier chrominance signal and an output signal of the said bandpass filter means, for carrying out subtraction between the two signals supplied thereto to obtain a noise signal component within said input carrier chrominance signal;

an amplitude limiter for limiting the amplitude of an output signal of said first subtracting circuit; and

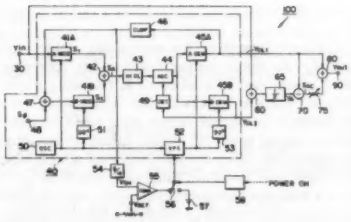
a second subtracting circuit supplied with said input carrier chrominance signal and an output signal of said amplitude limiter, for carrying out subtraction between the two signals supplied thereto to produce a carrier chrominance signal reduced of the noise signal component.

4,558,354

DELAY CIRCUIT

Sadaaki Tanaka, Hatano, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Aug. 8, 1983, Ser. No. 521,363
Claims priority, application Japan, Aug. 10, 1982, 57-137863
Int. Cl.[4] H04N *5/14*
U.S. Cl. 358—37 **6 Claims**



1. A delay circuit comprising:

oscillator means;

modulating means for effecting contour modulation of first and second input signals using outputs of said oscillator means as carriers;

delaying means for delaying a modulation output of said modulating means

variable phase shifting means for phase shifting said carriers;

demodulating means for effecting demodulation of the delayed modulation output by synchronous detection using the phase shifted carriers as synchronizing signals;

adding means for superimposing a reference signal on a first demodulated from said demodulating means corresponding to said first input signal to said modulating means and supplying the resultant signal as said second input signal to said modulating means; and

control means for controlling the amount of phase shift by said variable phase shifting means according to the reference signal included in a second demodulated signal demodulated by said demodulating means;

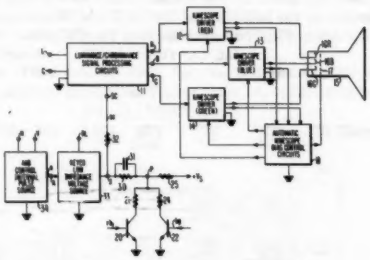
said first demodulated signal being delayed behind said first input signal supplied to said modulating means by an amount provided by said delaying means and said second demodulated signal being delayed behind said first input signal by double said amount.

4,558,355

TRILEVEL SANDCASTLE PULSE ENCODER

James Hettiger, Indianapolis, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed Dec. 14, 1983, Ser. No. 561,333
Int. Cl.[4] H04N *9/16*
U.S. Cl. 358—74 **5 Claims**



1. Trilevel sandcastle pulse encoding apparatus comprising:

a source of a first train of recurring monolevel pulses;

a source of a second train of recurring monolevel pulses, each of the pulses of said second train overlapping in time a portion of a pulse of said first train;

a source of a third train of recurring monolevel pulses timed to coincide with periodically recurring control intervals;

means, coupled to said source of said first train of pulses and to said source of said second train of pulses, for developing at a first terminal a train of bilevel pulses exhibiting a first voltage level during periods of overlapping of said pulses of said first and second trains, and exhibiting a second, lesser voltage level during the remaining, non-overlapping portions of the pulses of said first train;

a resistor interconnecting said first terminal and a second terminal; and

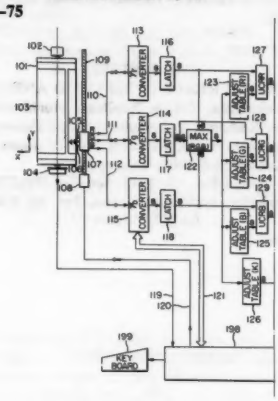
keyed means, coupled to said source of said third train of pulses, for developing a voltage of a third level, intermediate said first and second voltage levels, at said second terminal during said recurring control intervals; said voltage developing means exhibiting, during said control intervals, an output impedance significantly lower than the impedance exhibited by said resistor; said voltage developing means being effectively disabled during the periods intervening between successive ones of said control intervals and exhibiting, during said intervening periods, an output impedance significantly higher than the impedance exhibited by said resistor.

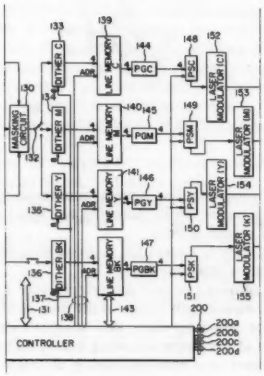
4,558,356

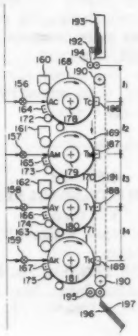
COLOR PRINTER

Katsuhiko Toda, Yokohama, and Susumu Sugiura, Yamato, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 26, 1982, Ser. No. 411,972
Claims priority, application Japan, Sep. 1, 1981, 56-136111
Int. Cl.[4] H04N *1/46*
U.S. Cl. 358—75 **18 Claims**







1. A color printer comprising:

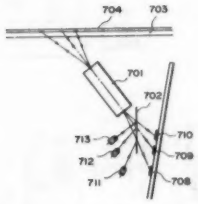
means for generating four color image signals;
recording means for recording images corresponding to the respective color image signals at respective different areas of a recording medium at substantially the same time;
means for transferring the images formed on the recording medium onto printing paper; and
means for controlling transfer timings for the respective images.

4,558,357

COLOR IMAGE READING METHOD AND APPARATUS

Katsumi Nakagawa, Tokyo; Noritaka Mochizuki, Yokohama; Toshiyuki Komatsu, Yokohama; Masaki Fukaya, Yokohama, and Mitsutoshi Kuno, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 17, 1983, Ser. No. 505,270
Claims priority, application Japan, Jun. 23, 1982, 57-107879
Int. Cl.[4] H04N *1/46*
U.S. Cl. 358—75 **5 Claims**



1. A color image reading apparatus comprising:
illuminating means for illuminating an object on a plurality of major scanning lines;
an imaging optical system for forming images of the object on the major scanning lines;
a plurality of image sensors for respectively sensing light in different wavelength ranges of the images of the object on the major scanning lines, said sensors extending in the direction of the major scanning line at different positions with respect to a minor scanning direction substantially orthogonal to the major scanning direction and being disposed at respective imaging positions of said imaging optical system with respect to the respective sensing wavelength ranges which imaging positions are spaced apart from each other in the direction of the optical axis of said imaging optical system; and
means for moving, in the minor scanning direction, the position of the object to be sensed by said image sensors relatively to said image sensors.

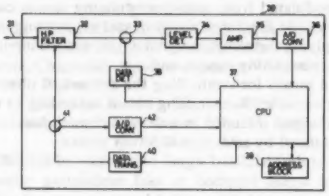
4,558,358

CABLE NETWORK MONITORING SYSTEM FOR CATV SYSTEM

Kazuyoshi Onda, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed May 27, 1982, Ser. No. 382,835
Claims priority, application Japan, May 27, 1981, 56-81622
Int. Cl.[4] H04N *7/18*
U.S. Cl. 358—86 **4 Claims**

1. A cable network monitoring system for a bi-directionally communicating CATV system, comprising; a center, a plurality of terminal units connected to said center through cables, and a plurality of monitor terminals disposed at certain locations in a cable network of said CATV system, each of said plurality of monitor terminals comprising: (a) means for receiving a polling signal specific thereto and including an address code and a downstream data signal sent from said center, (b) means for detecting a signal level of said polling signal transmitted from said center, and (c) means for transmitting an



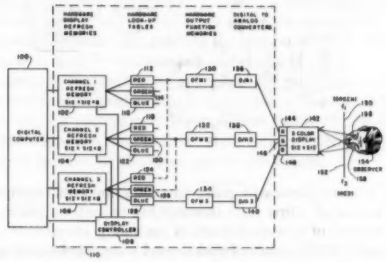
upstream signal responsive to said downstream data signal portion of said polling signal, said upstream signal including a signal indicative of the detected signal level of said same polling signal, whereby the cable network may be monitored at said center from said upstream signal.

4,558,359

ANAGLYPHIC STEREOSCOPIC IMAGE APPARATUS AND METHOD

Gilbert G. Kuperman, and Donald L. Wallquist, both of Dayton, Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 1, 1983, Ser. No. 547,610
Int. Cl.[4] H04N *13/00*
U.S. Cl. 358—89 **27 Claims**



1. A method for creating a stereoscopic analysis image from a monochrome input image having image features of varying pixel intensity comprising the steps of:
reproducing the original image pixel for pixel in a first color:
adding to the original image a second image comprised of second pixels of a second color each displaced from the corresponding original image pixel by a distance having a predetermined relationship with the intensity of said original image pixel;
viewing the composite reproduced image binocularly using color separation to preceive a stereoscopic view of the original image.

4,558,360

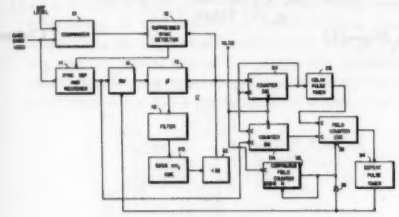
DECODER LOCKOUT DEFEAT CIRCUIT

Melvin C. Hendrickson, Elmhurst, and Robert L. Sproston, Jr., Mt. Prospect, both of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Filed Oct. 3, 1983, Ser. No. 538,259
Int. Cl.[4] H04N *7/167*
U.S. Cl. 358—120 **10 Claims**

1. In a television decoder of the type including a phase

locked oscillator developing a horizontal rate signal for controlling operation of suppressed sync detector means for detecting and restoring suppressed sync signals in a received television signal, the improvement comprising:



means for determining a video lock-out condition by counting the number of sync pulses in a given time period following the television signal vertical interval and;

means for breaking the lock of said phase locked oscillator if said number of sync pulses is insufficient.

4,558,361

PROCESS AND SYSTEM FOR THE COMPRESSION OF THE FLOW RATE OF DATA TRANSMITTED BETWEEN AT LEAST A TELEVISION TRANSMITTER AND A TELEVISION RECEIVER

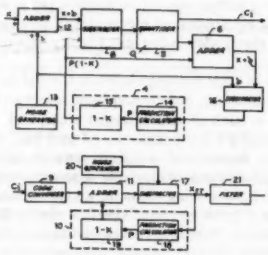
Jean-Yves Catros, Paris, France, assignor to Thomson CSF, Paris, France

Filed Jun. 16, 1983, Ser. No. 504,828

Claims priority, application France, Jun. 25, 1982, 82 11213

Int. Cl.⁴ H04N *7/12*

U.S. Cl. 358—136 **10 Claims**



1. A process for compressing the flow rate of data transmitted between at least one television transmitter and at least one television receiver, said data being coded at said transmitter by a differential coding device including a first predictor, a quantizer, a first transmitted data restoration device, and a code allocator, said data being decoded at said receiver by a differential decoder including a code converter, a second predictor, and a second transmitted data restoration device, comprising the steps of:

adding pseudo-random data to each data which is transmitted to cause quantization levels of said quantizer to fluctuate about a mean position; and

filtering data received from said second transmitted data restoration device to eliminate unwanted granular noise while retaining image contours, said filtering being accomplished by detecting luminance gradients or chrominance differences exceeding a predetermined threshold for revealing passage points of the image contours separating adjacent uniform zones, and by calculating a spatial mean for each point of luminance or chrominance sample values giving the state of adjacent points in the same uniform zone.

4,558,362

DIGITAL VIDEO SIGNAL TRANSMITTING APPARATUS

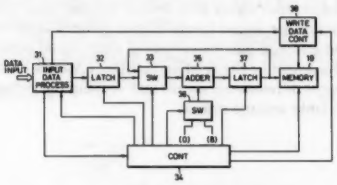
Hiroyuki Sugiyama, Isehara, Japan, assignor to Victor Company of Japan, Ltd., Japan

Filed Feb. 4, 1983, Ser. No. 463,933

Claims priority, application Japan, Feb. 9, 1982, 57-19067

Int. Cl.⁴ H04N *7/12*

U.S. Cl. 358—138 **7 Claims**



1. A digital video signal transmitting apparatus comprising:

a memory which is written in with a digital video signal of selected picture elements, said selected picture elements being selected from among all picture elements arranged in a matrix form constituting one picture frame, said selected picture elements being arranged at zigzag positions along either a horizontal direction or a vertical direction in said matrix form arrangement, said one picture frame comprising said selected picture elements and unselected picture elements which exist between said selected picture elements along the horizontal and vertical directions in said matrix form arrangement of all the picture elements; and

control means for carrying out read-out control to read out a digital video signal, said control means carrying out the read-out control so that signals of said selected and written in picture elements are read out as they are from said memory, and signals of selected and written in picture elements near picture elements which were not selected and not written in are read out to substitute for signals of the picture elements which were not selected and not written in.

4,558,363

GAMMA CORRECTION CIRCUIT

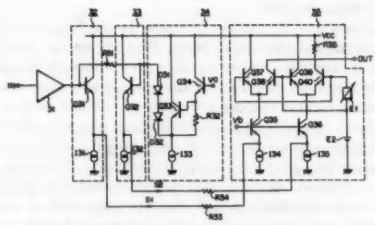
Yasuhiro Sugimoto, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jan. 27, 1983, Ser. No. 461,530

Claims priority, application Japan, Jan. 29, 1982, 57-12813

Int. Cl.⁴ H04N *5/20*

U.S. Cl. 358—164 **7 Claims**



1. A gamma correction circuit comprising:

an input terminal,

first gamma correction circuit means including an exponential impedance changing element for gamma-correcting a

non-gamma corrected input signal applied to the input terminal to produce a gamma-corrected signal,

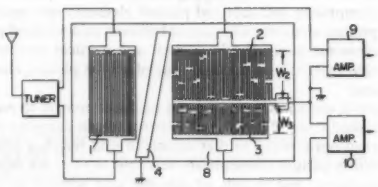
current adder circuit means for adding said gamma-corrected signal to said non-gamma corrected input signal, said adder circuit means comprising a double balance type adder circuit coupled to a series arrangement of variable and fixed DC voltage sources, and having first and second input terminals respectively connected to receive said gamma-corrected signal and said non-gamma corrected input signal, said current adder circuit means further having a combination of adjustable resistance means to add said gamma-corrected signal to said non-gamma corrected input signal at a desired adding ratio, while maintaining the signal levels of said gamma-corrected signal and said non-gamma corrected input signal coincident, by adjustment of the relative resistance values of the combination of resistance means and varying the voltage of said variable voltage source.

4,558,364

SURFACE ACOUSTIC WAVE DEVICE

Jun Yamada, Yokohama, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed May 17, 1983, Ser. No. 495,494
Claims priority, application Japan, May 19, 1982, 57-83067
Int. Cl.⁴ H04N *5/44*; H03H *9/64*
U.S. Cl. 358—188 **6 Claims**



1. A surface acoustic wave device comprising:

a piezo-electric substrate;

an input transducer means, in the form of a pair of interdigital electrodes, disposed on the piezo-electric substrate, for receiving a television signal containing a picture signal component of a wide band width and a sound signal component of a narrow band width and generating a surface acoustic wave corresponding to the television signal;

a first output transducer means, in the form of a pair of interdigital electrodes, being disposed on the piezo-electric substrate, said first output transducer receiving the surface acoustic wave and converting the surface acoustic wave into an electrical signal containing the picture signal component; and

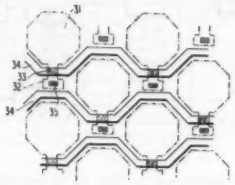
a second output transducer means, in the form of a pair of interdigital electrodes, being disposed on the piezo-electric substrate, extending in a direction orthogonal to a propagation direction of the surface acoustic wave and being located in close proximity to said first output transducer, said second output transducer means receiving the surface acoustic wave and converting the surface acoustic wave into an electrical signal containing the sound signal component, said second output transducer having an output impedance which matches a succeeding amplifier and being spaced apart from said input transducer such that the period of comb like characteristics defined as a reciprocal of the delay time of a multipath reflective wave has no substantial influence upon the narrow band width characteristics of the sound signal component.

4,558,365

HIGH-RESOLUTION HIGH-SENSITIVITY SOLID-STATE IMAGING SENSOR

Shigeharu Ochi, San Jose, Calif., assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 6, 1983, Ser. No. 501,332
Int. Cl.⁴ H04N *3/14*
U.S. Cl. 358—212 **7 Claims**



1. A solid-state imaging sensor comprising:

a semiconductor substrate;

a first set of electrodes disposed on said semiconductor substrate, each electrode of said first set of electrodes being formed in an undulating pattern with adjacent ones of said first set of electrodes being phased oppositely from one another to form enlarged areas at predetermined intervals between pairs of adjacent ones of said electrodes of said first set of electrodes, one row of said enlarged areas being formed between each two adjacent ones of said electrodes of said first set of electrodes, and adjacent rows of said enlarged areas being staggered with respect to one another;

a second set of electrodes disposed on said semiconductor substrate comprising electrodes disposed generally perpendicular to said electrodes of said first set of electrodes, ones of said electrodes of said second set of electrodes extending across respective aligned peaks and troughs of said first electrodes, all electrodes of said first and second sets of electrodes being electrically insulated from one another;

a plurality of light sensing elements formed in said semiconductor substrate, one of said light sensing elements being formed in each of said enlarged areas; and

a plurality of FET devices, one of said FET devices being provided for each of said light sensing elements, each of said FET devices comprising a source coupled to a respective light sensing element, a gate formed by and coupled to a respective one of said first electrodes, and a drain coupled to a respective one of said second electrodes, said drain being formed in said semiconductor substrate between two of said enlarged areas;

wherein each said light sensing element comprises a photodiode; and wherein said source of each of said FET devices extends over an area of a respective photodiode and forms an active layer of said photodiode.

4,558,366

SMEAR REDUCTION IN SOLID STATE TELEVISION CAMERA

Fumio Nagumo, Atsugi, Japan, assignor to Sony Corporation, Tokyo, Japan

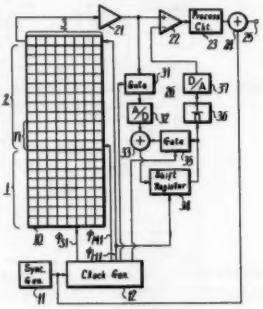
Continuation of Ser. No. 399,193, Jul. 16, 1982, abandoned. This application Oct. 29, 1984, Ser. No. 666,126
Claims priority, application Japan, Jul. 20, 1981, 56-113137
Int. Cl.⁴ H04N *5/30*
U.S. Cl. 358—213 **6 Claims**

1. A solid state television camera having a solid state image sensing device which reduces extraneous charges including a plurality of individual light sensing units arranged in both horizontal and vertical rows and for sequentially generating a signal corresponding to an image by transferring a charge

generated by said light sensing units and said device does not contain any horizontal rows of shielded photodetection regions, said solid state television camera comprising:

(A) a synchronizing signal generator for generating horizontal and vertical synchronizing signals;

(B) a clock pulse generator for generating clock pulses corresponding to said horizontal synchronizing signal and controlling the sequential transfer of the charge representing one horizontal line of the image, the number of said clock pulses being equal to the sum of the number of said horizontal rows and a predetermined number "n";



(C) detecting means for detecting the output signal of the image sensing device during a period equal to the number of said clock pulses, and said period occurring after the signal corresponding to said image is obtained and during a part of a vertical blanking period;

(D) a compensating signal generator supplied with the output of said detecting means for generating a compensating signal; and

(E) a compensating circuit for reducing the undesirable signal caused by said extraneous charges which mix with the charge representing the image during the transfer of the latter charge by using said compensating signal.

4,558,367

AUTOMATIC FOCUSING DEVICE FOR VIDEO CAMERA

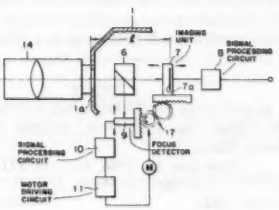
Shinji Urata; Hitoshi Hirobe, and Kohei Iketani, all of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 30, 1982, Ser. No. 434,270

Claims priority, application Japan, Jan. 19, 1982, 57-5358

Int. Cl.⁴ H04N *9/28*

U.S. Cl. 358—227 **6 Claims**



1. An automatic focusing device for a video camera comprising:

a taking lens;

an imaging plane for receiving object data from the taking lens;

focus detecting means for detecting focused light on the imaging plane and extracting a detection signal from said object data to provide a focus signal;

driving means responsive to said focus signal from said focus detecting means for moving said imaging plane for focusing; and

a camera body containing therein said driving means, said focus detecting means and said imaging plane.

4,558,368

STOP CONTROL APPARATUS FOR ELECTRONIC CAMERA

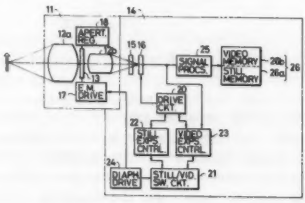
Harumi Aoki; Shigeo Enomoto; Tahei Morisawa, and Fumio Urano, all of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 14, 1984, Ser. No. 580,044

Claims priority, application Japan, Feb. 14, 1983, 58-22496

Int. Cl.⁴ H04N *5/26*

U.S. Cl. 358—228 **5 Claims**



1. A stop control apparatus for an electronic camera having aperture blades and which is capable of selectively performing a still picture photographing operation and a motion picture photographing operation comprising:

a video exposure control circuit for producing a first operating signal during said motion picture photographing operation;

a still exposure control circuit for producing a second operating signal during said still picture photographing operation;

an electromagnetic diaphragm control mechanism comprising an electromagnetic drive device coupled to said aperture blades;

means for coupling a selected one of said video exposure control circuit and said still exposure control circuit to said electromagnetic diaphragm control mechanism;

aperture value setting means operating during said still picture photographing operation; and

an aperture opening regulating means for determining an aperture opening in accordance with a selected aperture value, said regulating means producing a force acting against a force produced by said electromagnetic drive device of said electromagnetic diaphragm control mechanism said aperture opening regulating means comprising means for moving said regulating means to a position where said aperture opening regulating means will not interfere with said electromagnetic aperture control mechanism when said still picture photographing operation is switched over to said motion picture photographing operation.

4,558,369

FACSIMILE CONNECTION SYSTEM

Masaru Shinohara, Higashiyamoto; Makoto Ueno, Tokyo, and Tsunetaka Sakata, Hachioji, all of Japan, assignors to Iwasaki Tsushinki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 27, 1983, Ser. No. 565,626

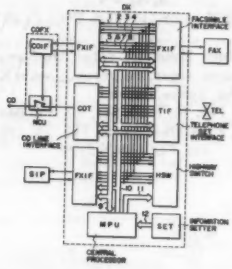
Claims priority, application Japan, Dec. 28, 1982, 57-227514; Dec. 28, 1982, 57-227520

Int. Cl.⁴ H04N *1/32, 1/44*

U.S. Cl. 358—257 **6 Claims**

4. In a voice-facsimile transceiver communication system

wherein voice and facsimile information is transmitted and received simultaneously comprising, a telephone system for voice communications, a plurality of facsimile transceiver apparatus for transmitting and receiving facsimile communication signals, means for converting voice communications and control signals of the telephone system to voice communication digital signals, means for converting facsimile communication signals of the facsimile transceiver apparatus facsimile digital signals, and control means receptive of the voice communication digital signals and of the facsimile digital signals for controlling by common means transmission of the voice communication digital signals and the facsimile communication digital signal simultaneously along separate paths between telephones of the telephone system and between corresponding ones of the plurality of the facsimile transceiver apparatus.

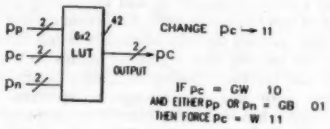


4,558,370

IMAGE PROCESSING METHOD FOR GRAPHICS IMAGES

Joan L. Mitchell, Ossining, and William B. Pennebaker, Carmel, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 21, 1983, Ser. No. 553,216
Int. Cl.[4] H04N *1/40;* **G09G** *1/14, 3/00;* **G06K** *9/36*
U.S. Cl. 358—260 **20 Claims**



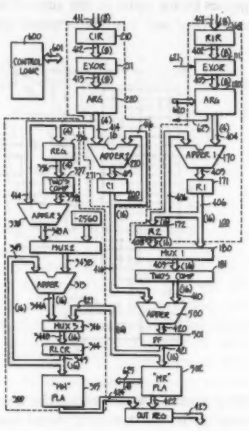
1. In a method for converting a graphics image into data representing the intensity values of the image pixels in binary format as either of two extreme values, e.g., black and white, as well as intermediate intensity values between said two extreme values, e.g., grays, to achieve efficient compression, resolution, and coding, the improvement comprising the step of: changing the intensity value of each pixel having an intermediate intensity value within a first predetermined range of said intermediate intensity values to a predetermined one of said extreme intensity values if said pixel is adjacent to a pixel having an intermediate intensity value within a second predetermined range of said intermediate intensity values.

4,558,371

METHOD AND DEVICE FOR TWO-DIMENSIONAL FACSIMILE CODING

Krishna Rallapalli, San Jose, and Shinkyo Kaku, Los Gatos, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Aug. 19, 1983, Ser. No. 524,818
Int. Cl.[4] H04N *1/40*
U.S. Cl. 358—261 **24 Claims**



1. A facsimile device for encoding the positions of change picture elements in a coding line of digitized picture data, with respect to the positions of change picture elements in a reference line of digitized picture data, said device comprising

a control logic for controlling the operations of said device;

means, coupled to said control logic and responsive to said coding line and reference line picture data for sequentially generating in parallel the accumulated run lengths of each change picture element in said coding line and reference line;

means responsive to said sequential generating means for determining the difference in accumulated run lengths of a coding line picture element and a reference line change picture element;

means coupled to said control logic and responsive to said determining means for encoding said difference in accordance with a predetermined code; and

whereby said control logic, responsive to said difference, selectively advances said generating means for the accumulated run length of the next coding line change picture element and the next reference line change picture element and enables said encoding means in accordance with predetermined conditions upon said difference.

4,558,372

SCANNING METHOD AND APPARATUS

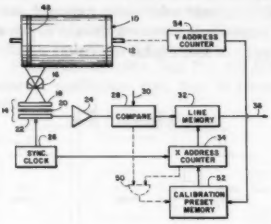
Robert G. Culter, Beaverton, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Jan. 19, 1984, Ser. No. 571,990
Int. Cl.[4] H04N *1/36*
U.S. Cl. 358—264 **14 Claims**

1. A scanning apparatus for producing an electrical representation of two-dimensional information, comprising:

means for electrically scanning across said two-dimensional information in a first direction at spaced locations in an orthogonal direction to produce electrical information representative of successive scans across said information, and means responsive to the extent of mechanical misregistration between said scanning means and said two-dimen-

sional information in said first direction for selecting the electrical information representative of selected scans in



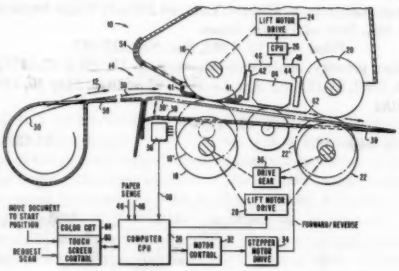
accordance with the extent of mechanical misregistration during said selected scans.

4,558,373

AUTOMATIC DATA CAPTURE SYSTEM WITH SPECIAL DOCUMENT HANDLING PRIOR TO NORMAL SCANNING

Armand J. Plasencia, Hopatcong; Robert J. Tusso, Chatham, and Alan P. Gilson, Boundbrook, all of N.J., assignors to Skantek Corporation, Warren, N.J.

Filed May 11, 1984, Ser. No. 609,299
Int. Cl.[4] H04N *1/04, 1/10, 1/02*
U.S. Cl. 358—285 **16 Claims**



1. An automatic video digitizing system for document scanning wherein a document is inserted into a roller feed arrangement located adjacent a video scanning head, comprising:

(a) at least one pair of document drive rollers initially spaced apart to permit said document to be inserted through the spacing between said drive rollers without damaging the input edges of said document;

(b) means for moving said opposing drive rollers from said spaced-apart, non-feed position into contact with each other;

(c) document sensing means for sensing the leading edge of said document;

(d) motor drive means, responsive to said document sensing means for driving said document backwards to a predetermined starting position where a front edge of said document is located at a preset distance from said video scanning head; and

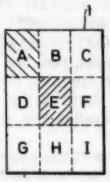
(e) motor means for rotating said drive rollers for driving said document forward from said starting position for scanning said document.

4,558,374

PICTURE DATA PROCESSING DEVICE

Masami Kurata, and Takashi Ohmori, both of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed May 11, 1983, Ser. No. 493,481
Claims priority, application Japan, May 14, 1982, 57-79892
Int. Cl.[4] H04M *1/04*
U.S. Cl. 358—287 **6 Claims**



1. In a picture data processing device of the type comprising a platen upon which document is disposed for irradiation from a light source to scan said document in a main scanning direction and an auxiliary scanning direction, said device having means for receiving light reflected from said platen and converting said reflected light into an electrical signal, the improvement comprising:

a mark position memory circuit for storing electrical signals generated by reading a mark specifying document, said mark specifying document indicating at least one portion of an original document to be processed; and

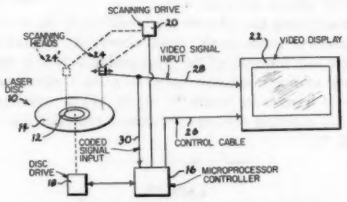
processing means receiving electrical signals generated by reading said original document and memory data from said mark position memory circuit in synchronism, said processing means masking out all but said at least one portion of said original document.

4,558,375

METHOD AND APPARATUS FOR RECORDING AND RETRIEVING VIDEO INFORMATION IN TWO MODES ON A SINGLE LASER RECORDING DISC

Carl G. Sontheimer, 14 Grays Oaks La., Greenwich, Conn. 06830

Filed Apr. 27, 1983, Ser. No. 489,164
Int. Cl.[4] H04N *5/76*
U.S. Cl. 358—342 **5 Claims**



1. The method of storing video information in at least two modes on a single memory laser disc which comprises the steps of:

recording still frame video information on said disc in a first annular region at a substantially constant angular velocity at the rate of one still frame per scanning revolution,

recording video program information relating to said still frame information on said disc in a second annular region at a substantially constant linear velocity,

wherein said first annular region is of relatively smaller

diameter and said second annular region is of relatively larger diameter, and

recording video code signals in said second annular region at those predetermined spots in the video program at which predetermined still frame information is intended to be included in the program.

4,558,376

METHOD AND SYSTEM OF REPRODUCTION OF MAGNETICALLY RECORDED VIDEO SIGNALS AT SPEEDS DIFFERING FROM RECORDING SPEED

Jürgen Heitmann, Seeheim, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

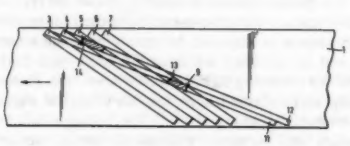
Filed Nov. 20, 1981, Ser. No. 323,456

Claims priority, application Fed. Rep. of Germany, Dec. 3, 1980, 3045543

The portion of the term of this patent subsequent to Jul. 24, 2001, has been disclaimed.

Int. Cl.⁴ H04N *5/782*

U.S. Cl. 360—10.1 **11 Claims**



1. Method of reproduction of video signals which are magnetically recorded on magnetic tape (1), looped about a head wheel (20), in which the speed of reproduction differs from a known recording speed,

and in which, upon recording, data representing the video signals are recorded on tracks (3, 4, 5, 6, 7) which are inclined with respect to a longitudinal edge of the tape so that, upon reproduction at a different speed, the scanning tracks (11, 12; 15, 16) of a reproduction head (9, 14, 10, 21) on the head wheel (20) do not coincide with the recorded tracks (3, 4, 5, 6, 7)

comprising the steps of

temporarily storing the reproduced signals which are of a quality sufficient for reproduction;

reading-out, at a predetermined television scanning standard, the temporarily stored signals subsequent to their having been stored;

and further including the steps of

providing at least two axially adjustable transducer heads (9, 14; 10, 21) on the head wheel (20);

and controlling the relative axial position of the at least two transducer heads on the head wheel with respect to each other as a function of the relationship between recording speed and reproduction speed to place a maximum number of transducer heads (9, 14; 10, 21) in scanning transducing position over the previously recorded tracks (3, 4, 5, 6, 7).

4,558,377

DIGITAL TELEVISION APPARATUS

Mark C. Collins, and John G. S. Ive, both of Basingstoke, England, assignors to Sony Corporation, Tokyo, Japan

Filed May 5, 1982, Ser. No. 375,105

Claims priority, application United Kingdom, May 6, 1981, 8113802

Int. Cl.⁴ H04N *5/76*

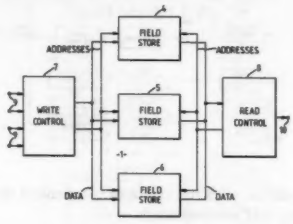
U.S. Cl. 360—10.1 **11 Claims**

1. Digital television apparatus comprising:

a field store arrangement comprising at least first, second and third field stores each for storing digital signals relating to one field of a television signal;

means for supplying a digital television signal at a variable rate to said field store arrangement;

means for supplying said digital television signal to at least one of said field stores for writing therein, the number of said field stores being written therein depending on said rate of supply of said digital television signal;



for reading signal from at least one of said field stores, the number of said field stores being read therefrom depending on said rate of supply of said television signal, with no said field store being written into at the same time that it is read from; and

means for cyclically writing to and reading from said field stores.

4,558,378

METHOD AND APPARATUS FOR A MAGNETIC RECORDING/REPRODUCING

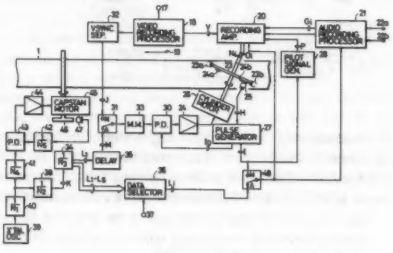
Akira Shibata, Katsuta, and Shinichi Ohashi, Chigasaki, both of Japan, assignors to Hitachi, Ltd. and Hitachi Video Engineering Inc., both of Tokyo, Japan

Filed Aug. 17, 1983, Ser. No. 523,855

Claims priority, application Japan, Aug. 27, 1982, 57-147528; Sep. 3, 1982, 57-152752; Sep. 17, 1982, 57-161010; May 30, 1983, 58-94182

Int. Cl.⁴ H04N *5/782*

U.S. Cl. 360—19.1 **35 Claims**



1. A method for recording information on a tape by rotating heads in a helical scan type magnetic recording apparatus, comprising the steps of:

(a) generating a plurality of N track indicating pulses which are phase-locked to the rotation of the rotating heads, each of which corresponds in time to the tracking time by said rotating heads of a respective one of a plurality of N information tracks disposed in parallel to the direction of the tape running;

(b) selecting one of said N track indicating pulses; and

(c) supplying an information signal to the heads in time with the selected track indicating pulse.

4,558,379
DISTURBANCE DETECTION AND RECORDING SYSTEM

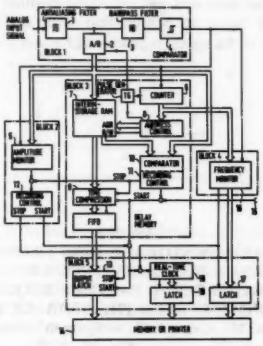
Helmut Hütter, Stuttgart, and Heinz Maier, Ostfildern, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jun. 25, 1984, Ser. No. 624,058

Claims priority, application Fed. Rep. of Germany, Jun. 24, 1983, 3322862

Int. Cl.[4] G11B *5/00*

U.S. Cl. 360—32 3 Claims



1. In a system for detecting and recording disturbances in a periodic signal, said system having means for digitizing samples of the periodic signal, delay memory means for storing and delaying the digitized samples of the periodic signal, comparator means for comparing the digitized samples from successive signal periods of the periodic signal and means responsive to a disturbance in the periodic signal for generating a signal for transferring delayed digitized samples stored in the delay memory means to an output device for recording the delayed signal samples, the improvement comprising means for generating a sequence of sampling pulses for controlling the generation of said digitized samples by said digitizing means, interim storage means for storing the digitized samples for each successive signal period, means for counting the sampling pulses in each successive signal period, means for storing a count of the number of sampling pulses counted for each signal period, means coupling the digitized samples from said digitizing means to said comparator means and address control means coupled to said interim storage means and to said storing means for addressing said interim storage means in response to a count in said storing means whereby the digitized samples stored in said interim storage means are fed to said comparator means, said comparator means thereby comparing the digitized samples from said interim storage means and from said digitizing means, said samples being from successive signal periods of said periodic signal, and generating a control signal for transferring the digitized samples in said delay memory means to said output recording device if said digitized samples for successive signal periods fed to said comparator means differ by a predetermined threshold amount.

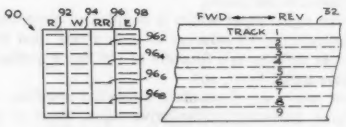
4,558,380
DIGITAL TAPE TRANSPORT FOR SELECTIVELY RECORDING IN EITHER A PARALLEL OR SERIAL MODE

Carl D. Porter, Valencia, Calif., assignor to Pertec Peripherals Corporation, Chatsworth, Calif.

Filed May 11, 1983, Ser. No. 493,642

Int. Cl.[4] G11B *5/09, 15/48*

U.S. Cl. 360—53 10 Claims



1. An improved magnetic tape apparatus for recording and reading digital data comprising:

a read and write transducer assembly means; means for drawing an elongated magnetic tape along a path past said transducer assembly means in either a firt or second direction where said direction is opposite to said first direction;

said transducer assembly means including a plurality of N write transducers aligned across the width of said tape path to record data along N parallel tracks on said tape, where N is a positive integer other than 1;

said transducer assembly means further including a first plurality of read transducers aligned across the width of said tape path parallel to and closely spaced in said first direction from said write transducers;

said transducer assembly means further including a second plurality of read transducers aligned across the width of said tape path parallel to and closely spaced in said second direction from said write transducers;

said first plurality of read transducers consisting of N transducers and said second plurality of read transducers consisting of N/2 transducers if N is even or (N-1)/2 transducers if N is odd.

4,558,381
HIGH SPEED SCANNING ARRANGEMENT FOR VIDEO TAPE RECORDER

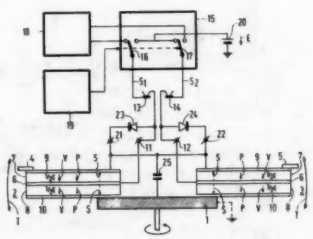
Hendrik J. Bergmans, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 19, 1983, Ser. No. 524,729

Claims priority, application Netherlands, Jun. 10, 1983, 8302075

Int. Cl.[4] G11B *5/52*

U.S. Cl. 360—77 5 Claims



1. An apparatus for recording and/or reproducing information on a record carrier in the form of a tape in tracks which are inclined relative to the longitudinal axis of the record carrier, which apparatus comprises

a first magnetic head,

a first electro-mechanical actuator on which said magnetic head is arranged for controlling the position of said mag-

netic head in a direction transverse to the tracks, said actuator comprising two piezoelectric transducers which are each arranged on one side of acommon electrode and which are each provided with an electrode on the side which is remote from said common electrode,

a rotatable body, on which said actuator is mounted, for moving the magnetic head in the track direction,

a tracking signal generator for supplying a signal to the actuator for controlling the position of the magnetic head relative to the tracks,

a drive signal input which is coupled to electrodes of the piezoelectric transducers in such a way that the transducer deflects as a function of the signal applied to said drive signal input, and

a first rotary signal-coupling means for coupling the drive signal generator to the drive signal input of actuator, characterized by

a bias voltage input for applying a bias voltage so that both piezoelectric elements are biased in the direction of polarization, at least during periods in which they are driven by the drive signal,

a buffer element for buffering said bias voltage during said periods,

a first voltage isolator between the bias voltage input and the drive voltage input, and

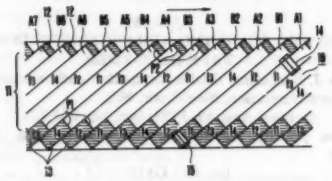
switching means arranged between the tracking signal generator and the signal coupling means, for alternately connecting the drive signal input to the tracking signal generator and a source of bias voltage via said signal coupling means.

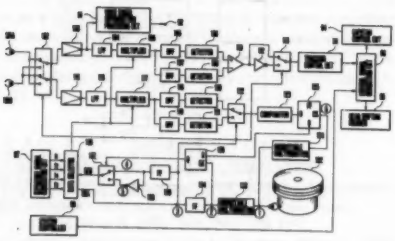
4,558,382

VIDEO SIGNAL REPRODUCING APPARATUS

Hiroo Edakubo, Tokyo; Nobutoshi Takayama, and Hiroyuki Takimoto, both of Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 1, 1984, Ser. No. 576,028
Int. Cl.⁴ G11B *5/58*
U.S. Cl. 360—77 **37 Claims**





37. An information signal reproducing apparatus for reproducing an information signal from a recording medium which is recorded with plural kinds of pilot signals of different frequencies superimposed on said information signal one after another, said apparatus comprising:

(a) a reproducing head;

(b) reproducing means arranged to reproduce said information signal by using a part of a signal reproduced by said reproducing head;

(c) discriminating means for discriminating the kind of said pilot signal superimposed on said information signal reproduced by said reproducing means, said discriminating means being arranged to use for discrimination a part of the signal reproduced by said reproducing head which is not used by said reproducing means;

(d) reference signal generating means for generating a reference signal the frequency of which is arranged to be determined according to said discriminating means; and

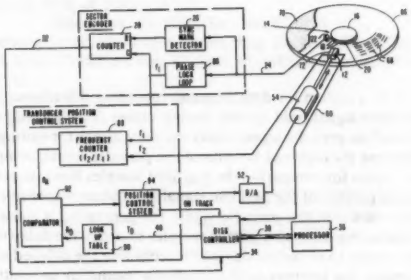
(e) position control means for controlling the relative position of said head and said recording medium by using said reference signal in conjunction with said pilot signals included in the signal reproduced by said head.

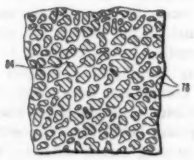
4,558,383

INFORMATION STORAGE DISK TRANSDUCER POSITION CONTROL SYSTEM USING A PRERECORDED SERVO PATTERN REQUIRING NO ALIGNMENT WITH THE STORAGE DISK

Mark Johnson, Mt. Kisco, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1983, Ser. No. 509,746
Int. Cl.⁴ G11B *5/55, 5/56, 7/00, 23/30*
U.S. Cl. 360—77 **17 Claims**





1. Information storage apparatus, comprising:

an information storage disk having a recording surface,

a detectable pattern on said disk for defining separate recording tracks,

said detectable pattern comprising a dense array of detectable marks on said disk,

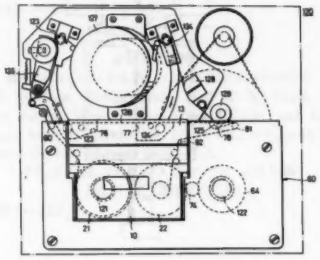
said dense array being substantially translation invariant.

4,558,384

MINIATURE TYPE TAPE CASSETTE AND ADAPTER MEANS

Hiroyuki Umeda, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Continuation of Ser. No. 322,174, Nov. 17, 1981, abandoned. This application Oct. 10, 1984, Ser. No. 659,500
Claims priority, application Japan, Nov. 25, 1980, 55-164704
Int. Cl.[4] G11B *23/04*
U.S. Cl. 360—94 **4 Claims**



1. A miniature video cassette which fits directly into a first recorder/reproducer apparatus and which also fits into an adapter having parts corresponding to parts of said first apparatus and further having a size and shape of a standard large size cassette, so that said miniature cassette may be used interchangeably in said first or a second recorder/reproducer apparatus designed to receive said standard large size cassette, said miniature cassette comprising:

a generally rectangular case having spaced parallel top and bottom plates with openings in a front edge of at least one of said plates for accepting loading poles of said first apparatus;

a supply reel with a large diameter hub and flange and a take-up reel with a small diameter hub and flange rotatably supported inside said case in a side-by-side relationship;

tape wound on said heels and extending along a path adjacent said openings which tape is engaged by either said loading poles in said first apparatus or guiding poles fixed in said adapter for guiding said tape drawn out from said openings and for positioning said tape at a position in said adapter corresponding to the position of the tape in said standard cassette;

lid means pivotably attached to said case to swing between closed and opened positions, the closed position covering said opening, said opened position locating said lid in substantially the plane of one of said spaced parallel plates and forming a contiguously contacting dust seal with an edge of said one plate;

coupling means in the hub of said supply reel for being driven directly by a drive shaft in both said first and said second apparatus; and

means on the flange of said take-up reel for engaging a power transmission on said first apparatus or on said adapter.

4,558,385

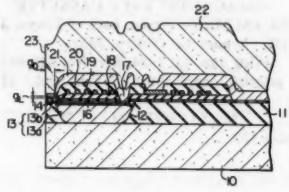
THIN FILM MAGNETIC HEAD

Nobuyuki Kaminaka; Kenji Kanai, both of Neyagawa, and Noboru Nomura, Kyoto, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 335,579, Dec. 29, 1981, abandoned. This application Sep. 4, 1984, Ser. No. 647,259
Claims priority, application Japan, Jan. 9, 1981, 56-2344
Int. Cl.[4] G11B *5/16*
U.S. Cl. 360—126 **7 Claims**

1. In a thin film magnetic head including a non-magnetic layer, a lower magnetic layer, a conductive layer constituting of a signal winding and an upper magnetic layer which are formed on a substrate, the improvement wherein:

said lower magnetic layer is disposed substantially within a recess in said non-magnetic layer, the thickness of said lower magnetic layer being substantially equal to the depth of the recess in said non-magnetic layer, said lower magnetic layer comprising a first portion positioned in the recess and a second portion positioned to be closed to a



recording medium on which a read/write operation is to be performed, the thickness of the first portion being substantially equal to the depth of the recess and the second portion being thinner than the first portion; and

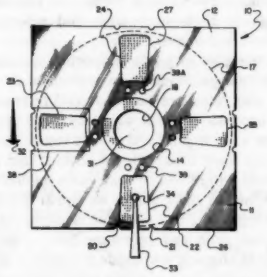
said conductive layer constituting the signal winding is formed in a single layer on a first insulating layer formed on said lower magnetic layer, and said upper magnetic layer is formed on said conductive layer, a second insulating layer being interposed between said upper magnetic layer and said conductive layer.

4,558,386

HEAD CLEANER FOR FLOPPY DISK DRIVE

Stephen Kara, Thousand Oaks, Calif., assignor to SSK Enterprises, Inc., Westlake Village, Calif.

Filed Jun. 4, 1982, Ser. No. 384,908
Int. Cl.[4] G11B *5/41, 23/02*
U.S. Cl. 360—128 **7 Claims**



1. In a head cleaner for a disk drive comprising a generally flat, rectangular sheath having flexible top and bottom walls and four edges, a central hub receiving opening through which a hub of a disk drive can extend, a generally flat, absorbent member received within the sheath and having a central opening located in the hub receiving opening of the sheath, and first head receiving aperture means through one wall of the sheath positioned about a line perpendicular from the edge of the sheath to the center of the hub receiving opening of the sheath such that it is positioned under the head of the disk drive when the head cleaning apparatus is in the disk drive, the improvement comprising the provision:

three other head receiving aperture means apart from the first head receiving aperture means through the one wall of the sheath, the first head receiving aperture means and

the three other head receiving aperture means being on the four lines perpendicular from the center of the hub to the four edges of the sheath for permitting contact of the absorbent member by the head through the first and the three other head receiving aperture means irrespective of which edge of the sheath is inserted into the disk drive.

4,558,387

MAGNETIC TAPE CASSETTE

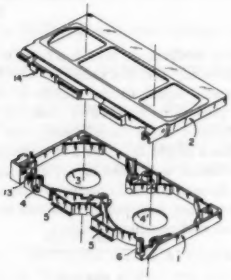
Haruo Shiba, and Michio Iizuka, both of Tokyo, Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Jun. 12, 1984, Ser. No. 619,987

Claims priority, application Japan, Jul. 11, 1983, 58-106532[U]

Int. Cl.⁴ G11B *23/02, 23/04*

U.S. Cl. 360—132 **4 Claims**



1. A magnetic tape casette comprising:

upper and lower casings;

guide members for guiding the running of a magnetic tape;

at least one reference hole formed in either of said upper and lower casings and positioned so as not to obstruct the path of said magnetic tape;

at lest one reference boss formed in the other one of said casings in alignement with said reference hole to be closely fitted therein, and;

at least one pair of guide supporting members for holding one of said guide members positioned at a given distance from said reference hole and said reference boss, said at least one pair of guide supporting members further comprising a guide pin fixed to said lower casing and a guide pin boss fixed to said upper casing, said guide pin being disposed within one of said guide members and having a recess means disposed in an upper portion thereof for receiving said guide pin boss, wherein said closely fitting reference hole and reference boss comprise means for precisely aligning said guide pin boss in said recess means of said guide pin to maintain perpendicularity of said guide member.

4,558,388

SUBSTRATE AND SUBSTRATE HOLDER

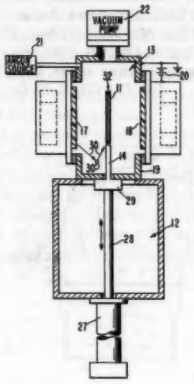
Walter E. Graves, Jr., San Jose, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Nov. 2, 1983, Ser. No. 548,124

Int. Cl.⁴ G11B *5/82;* B05D *3/00, 5/12*

U.S. Cl. 360—135 **6 Claims**

4. A magnetic disc comprising a substantially rigid substrate of non-magnetic material, said substrate having two parallel planar faces intersecting a peripheral edge, said edge of the substrate having a groove therein whereby the substrate can be supported by contact with the interior surfaces of said groove, said substrate having a coating of magnetic material on each of



said faces, and said coating extends to said edge at all locations around the edge.

4,558,389

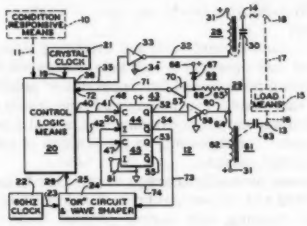
CONTROL LOGIC SAFETY MONITORING CIRCUIT MEANS

Robert A. Black, Jr., Brooklyn Center; Rodney L. Clark, Burnsville; Kenneth B. Kidder, Coon Rapids, and Paul B. Patton, Columbia Heights, all of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Jan. 14, 1980, Ser. No. 112,010

Int. Cl.⁴ H02H *3/20*

U.S. Cl. 361—88 **11 Claims**



1. Control logic safety monitoring circuit means adapted to be connected to condition responsive means to operate load control means wherein said safety monitoring circuit means monitors the safe operation of itself and of said load control means, including: control logic means having a plurality of input and output port means with said condition responsive means adapted to be connected to input port means; power line responsive clock means connected to control logic interrupt input port means and having a fixed frequency signal when power is being supplied to said safety monitoring circuit means; control logic clock means connected to a clock input port means of said control logic means and having a second fixed frequency signal to be utilized by said control logic means in controlling the operation of said control logic means; safety timer means connected to control logic means output trigger port means to receive a clock pulse to initiate the operation of said safety timer means; said safety timer means having first output means connected to operate safety switch means which has a normally non-conductive condition; said safety timer means having second output means connected to said

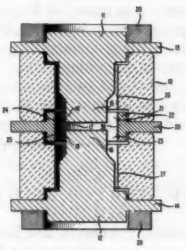
control logic interrupt input port means; load switch means connected to further control logic output port means with said load switch means being controlled by said control logic means in response to said condition responsive means; said load switch means and said safety switch means being adapted to control load means; and feedback logic means connected from said safety switch means to control logic feedback input port means to enable said control logic means to verify the status of said safety switch means; said control logic means monitoring both of said clock means, said feedback logic means, and said safety timer means while said safety timer means monitors said control logic means.

4,558,390

BALANCED DUAL-GAP PROTECTOR

Placido S. Fortino, Bethlehem; Laird K. S. Haas, Orefield; Siu-Ping Hong, Wescosville; Wing C. Lo, and Edward J. Neupauer, both of Bethlehem, all of Pa., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 15, 1983, Ser. No. 561,886
Int. Cl.⁴ H02H *9/06*
U.S. Cl. 361—119 **7 Claims**



1. A surge protector comprising:
a pair of electrodes disposed in a housing and having side surfaces facing the housing; and
a third electrode extending around the periphery of said housing so as to define essentially parallel gaps with the side surfaces of the said pair of electrodes, a portion of at least one electrode defining each gap having a surface coating which reduces the breakdown voltage of that gap after the breakdown of the other gap, wherein said coating is a mixture comprising zirconium hydride, barium zirconate, silver powder and glass, or a mixture comprising Na_2O, BaO, B_2O_3, Al_2O_3 and SiO_2.

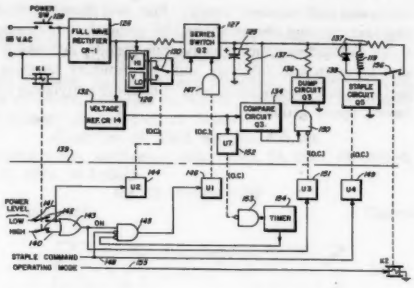
4,558,391

CAPACITIVE DISCHARGE DRIVE FOR ELECTRIC STAPLER

Joseph W. Ward; Raymond A. Povio, both of Pittsford; Russell G. Schroeder, Rochester, all of N.Y., and Patrick S. Chan, Stoneham, Mass., assignors to Xerox Corporation, Stamford, Conn.

Filed Feb. 14, 1983, Ser. No. 466,288
Int. Cl.⁴ H01H *47/32*
U.S. Cl. 361—155 **15 Claims**

1. An apparatus for driving fasteners into a plurality of sheet material to bind the same having a fastener driving means including a driver element, an electromechanical actuator, which when energized, actuates the driving means for moving the driver element against fastener to drive the same into the sheet material to be bound, and a drive circuit for selectively energizing the actuator, the improvement wherein;
the drive circuit comprises an ac referenced circuit connected to the actuator and a control circuit,
an energy storage means in the ac circuit to be charged thereby in response to a control input to said control circuit, said energy storage means being operatively connected to the actuator for energizing the same upon discharge thereof, and



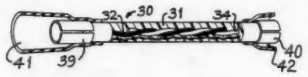
means in said control circuit for modifying the level of the discharge of said energy storage means.

4,558,392

RESISTIVE-CAPACITIVE IGNITION TRANSMISSION CABLE

Martin E. Gerry, 13452 Winthrope St., Santa Ana, Calif. 92705

Filed Sep. 4, 1984, Ser. No. 647,166
Int. Cl.⁴ F23Q *3/00*; H03H *7/01*
U.S. Cl. 361—253 **30 Claims**



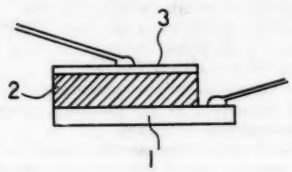
1. An ignition current transmission cable, said cable having a body comprising electrical insulation, characterized by:
a capacitive element embedded in said electrical insulation; and
a resistive element embedded in said electrical insulation, said resistive element being connected in parallel with the capacitive element, said capacitive and resistive elements constituting means for passing ignition current through the cable.

4,558,393

MOISTURE SENSOR

Junichi Tanaka, Tenri; Hisatoshi Furubayashi, Yamatokoriyama; Masanori Watanabe, Tenri, and Masaya Hijikigawa, Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Japan

Filed Apr. 27, 1984, Ser. No. 604,387
Claims priority, application Japan, Apr. 28, 1983, 58-76843
Int. Cl.⁴ H01G *5/20*
U.S. Cl. 361—286 **4 Claims**



1. A moisture sensor comprising a substrate, a moisture

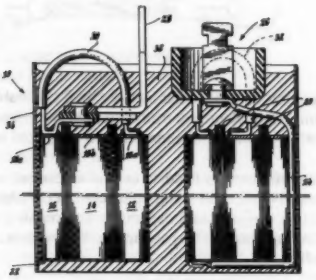
sensitive polymer film having hydroxyl groups formed on said substrate, an electrode formed on said moisture sensitive film, and a chemical modification layer disposed between said substrate and said moisture sensitive film, said chemical modification layer having chemical bonding strength to both said substrate and said moisture sensitive film thereby increasing adhesion between said substrate and said moisture sensitive film, said chemical modification layer containing a silylating reagent having epoxy groups.

4,558,394

CAPACITOR UNIT WITH MULTIPLE SELECTABLE CAPACITANCE VALUES

Robert M. Stockman, Brookfield Center, Conn., assignor to American Radionic Co., Inc., Danbury, Conn.

Filed Apr. 2, 1984, Ser. No. 596,012
Int. Cl.⁴ H01G *1/14, 1/13*
U.S. Cl. 361—306 **4 Claims**



1. A capacitor unit having multiple possible capacitance values selectable by the user which comprises:

a plurality of sub-capacitors, each having first and second plates separated by a dielectric, wound concentrically and sequentially with the second, and each succeeding, capacitor being wound upon the preceding capacitor to form a single multi-capacitor section, the first plates of said capacitors extending to a first end of said section and the second plates of said capacitors extending to a second end of said section;

means for electrically separating the first plates of said capacitors at the first end of said section;

conductive means electrically interconnecting the second plates at the second end of said section;

means encapsulating said section;

electrical terminal means connected to the first plate of one of said capacitors and extending outwardly from said encapsulating means; and

insulated conductor means interconnecting the first plates of at least one pair of said capacitors and partially exposed externally of said encapsulating means,

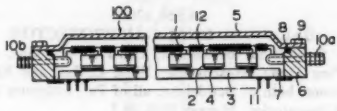
whereby said conductor means may be cut to alter the capacitance of said capacitor unit.

4,558,395

COOLING MODULE FOR INTEGRATED CIRCUIT CHIPS

Minoru Yamada, Iruma; Akira Masaki, Tokyo; Masakazu Yamamoto; Keiichirou Nakanishi, both of Kokubunji; Takashi Nishida, Tokyo; Takahiro Daikoku, Ibaraki; Fumiyuki Kobayashi, Sagamihara, and Kuninori Imai, Kanagawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 26, 1984, Ser. No. 604,003
Claims priority, application Japan, Apr. 27, 1983, 58-72896
Int. Cl.⁴ H05K *7/20*
U.S. Cl. 361—385 **17 Claims**



1. A cooling module for integrated circuit chips comprising:

a plurality of integrated circuit chips mounted on a wiring substrate;

cooling members, one provided for each of said integrated circuit chips in heat conductive relationship therewith, each of said cooling members having therein space in which to circulate a coolant; and

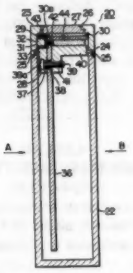
flexible pipes connected to their associated cooling members, said coolant being caused to flow into or out of the spaces of said cooling members through said pipes.

4,558,396

DISPLAY DEVICE FOR PORTABLE TYPE ELECTRICAL EQUIPMENT

Yoshimasa Kawabata, Yokohama, and Susumu Otsuki, Yamato, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 26, 1983, Ser. No. 517,379
Claims priority, application Japan, Jul. 29, 1982, 57-115771[U]
Int. Cl.⁴ H05K *05/02*
U.S. Cl. 361—399 **9 Claims**



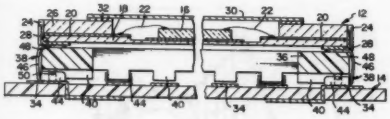
1. A display device for electrical equipment, said display device comprising: a casing for containing the equipment, said casing having a recess defined along the interior thereof; a transparent plate mounted in said casing; a display panel positioned in the casing inwardly of said transparent plate; a resilient connector which has the form of an elongated rod and is received in the recess formed in said casing; a printed board; and fastening means securely holding said printed board in said casing by, said display panel being disposed adjacent an end of said printed board and extending in the direction perpendicular to the plane of said printed board, said resilient connector serving to electrically connect said printed board to said display panel.

4,558,397

INTERPOSER CONNECTOR FOR SURFACE MOUNTING A CERAMIC CHIP CARRIER TO A PRINTED CIRCUIT BOARD

Billy E. Olsson, New Cumberland, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 19, 1983, Ser. No. 562,773
Int. Cl.[4] H01R 23/72
U.S. Cl. 361—404 10 Claims



1. An interposer connector for surface mounting of a ceramic chip carrier to a printed circuit board which comprises a dielectric base member having electrical terminals secured on the sides of the base member with first contact sections comprising means for soldered electrical connection with respective conductive pads of a printed circuit board and second contact sections for electrical connection with respective conductive pads of the ceramic chip carrier, characterized in that:

said base member has bottom surfaces provided with a plurality of adjacent projections along at least one side separated by slots formed between adjacent projections;

said first contact sections are U-shaped and are mounted on respective ones of said projections;

said second contact sections are flat and extend along and engage planar surfaces of said base member; and

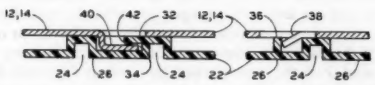
intermediate sections connect the first and second contact sections and extend along said sides of the base member.

4,558,398

PRINTED CIRCUIT BOARD STORAGE CABINET

Leo O. Drake, Ridge La., Mill Neck, N.Y. 11765

Filed Sep. 26, 1984, Ser. No. 654,392
Int. Cl.[4] H05K 7/14
U.S. Cl. 361—415 10 Claims



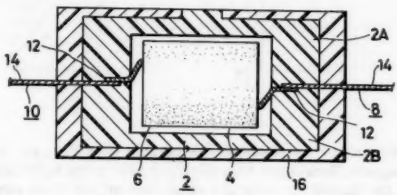
1. A storage cabinet for printed circuit boards comprising: a housing having a pair of substantially parallel and opposingly spaced flat surface support members for accommodating a plurality of printed circuit boards substantially normally therebetween, printed circuit board retaining members for detachable securement on each of said support members in the interior of said housing, said retaining members comprising a plural retaining plates, each being substantially flat and planar and having a front and a rear surface, said plates having grooves on the front surface extending uninterruptedly between its edges for supportingly receiving printed circuit boards which substantially conform in thickness to said grooves, and means for slidable detachable engagement of said plural plates on said support members, comprising a plurality of locking bars and at least one locking ridge each integral with and projecting out of the plane of said plates from the rear surface of said plates, said locking bars having in cross section a portion overlaying said plate and forming therewith a lateral channel, and a plurality of flexible resilient elongated first and second fingers each integral with and projecting out of the plane of said support members, said second fingers being bent downwardly and laterally from the plane of said supporting member in a direction opposite to said first fingers to enter into said lateral channel, said first fingers being bent downward and in a lateral direction to engage said locking ridge, and said first fingers urging said second fingers into said channel.

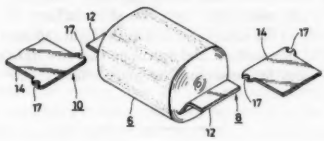
4,558,399

ELECTROLYTIC CAPACITOR AND A PROCESS FOR PRODUCING THE SAME

Tatsuro Toyama, Kanagawa, and Masayuki Fujiwara, Tokyo, both of Japan, assignors to Nippon Chemi-Con Corporation and Hitachi Limited, both of, Japan

Filed Oct. 19, 1982, Ser. No. 435,186
Claims priority, application Japan, Oct. 19, 1981, 56-166654; Oct. 19, 1981, 56-166655
Int. Cl.[4] H01G 9/00
U.S. Cl. 361—433 8 Claims





1. An electrolytic capacitor comprising:

a capacitor element including a pair of opposing electrodes composed of foils and a pair of lead terminals extending from said electrodes respectively;

a thermoplastic synthetic resin case member having a space therein in which said capacitor element is fixedly disposed with said lead terminals being extended outwardly;

a thermosetting synthetic resin coating formed on said thermoplastic synthetic resin case to mould at least said lead terminals airtightly; and

an electrolyte impregnating said element;

wherein each of said terminals comprises an internal portion, one end of which is connected to a corresponding one of said electrodes and an external portion having one end connected to the other end of said internal portion and the other end exposed outside said coating; and

wherein a junction portion of said internal and external portions is encapsulated in said case member with no intervening voids.

4,558,400

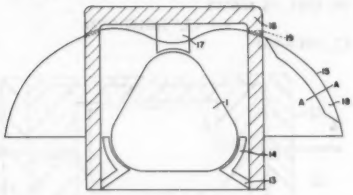
PRODUCTION OF LIGHT FROM A FLUORESCENT TUBE WITH REDUCTION OF THE DAZZLING

Johann Buser, Ringstrasse 14, 4414 Füllinsdorf, Switzerland

PCT No. PCT/CH83/00002, § 371 Date Sep. 14, 1983, § 102(e) Date Sep. 14, 1983, PCT Pub. No. WO83/02526, PCT Pub. Date Jul. 21, 1983
PCT Filed Jan. 7, 1983, Ser. No. 537,395
Claims priority, application Austria, Jan. 15, 1982, 130/82; Switzerland, Feb. 4, 1982, 692/82; Sep. 23, 1982, 5611/82
Int. Cl.[4] F21M 3/30
U.S. Cl. 362—222 9 Claims

1. A fluorescent lighting fixture for producing non-glaring light, comprising an elongated fluorescent tube of triangular cross-section having three substantially flat elongated side

surfaces, a mounting plane for the fixture, means for holding the opposite end regions of the fluorescent tube for mounting said fluorescent tube to said mounting plane, said means for holding positioning one of said three substantially flat elongated side surfaces of said fluorescent tube substantially parallel to said mounting plane for the fixture and directed away from said mounting plane, elongated reflecting means connected between said mounting plane and said elongated fluorescent tube, said elongated reflecting means including two light reflecting inside surfaces curved longitudinally symmetri-



cally about a longitudinal axis parallel with the axis of said elongated fluorescent tube to reflect part of the light radiated by the fluorescent tube, the other two of said three substantially flat elongated side surfaces conveying toward each other toward said elongated reflector means and substantially facing said two light reflecting inside surfaces whereby the light radiated from said other two flat side surfaces is reflected substantially in the same direction as the light radiated from the said one flat side surface, and means on said two light reflecting inside surfaces for lessening the glare effect of the reflected light.

4,558,401

VEHICLE LAMP ASSEMBLY

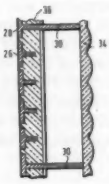
Nicholas W. Tysoe, St. John's, England, assignor to Britax Vega Limited, Worchestershire, England

Continuation of Ser. No. 408,206, Aug. 16, 1982, abandoned. This application Oct. 5, 1984, Ser. No. 658,063

Claims priority, application United Kingdom, Aug. 29, 1981, 8126421

Int. Cl.⁴ F21V *13/00*

U.S. Cl. 362—290 **4 Claims**



1. A vehicle lamp assembly comprising a light source, a colorless light transmitting member carrying a plurality of strips formed of a light-absorbing material, baffle elements of light-absorbing material extending perpendicular to a surface of the light transmitting member towards the light source, each baffle element being aligned with a respective one of the parallel strips and being thinner than its corresponding strip in a direction parallel to said surface, lens means spaced from the light transmitting member and disposed between the light source and the baffle elements and arranged to concentrate light from the light source between adjacent baffle elements and then between adjacent strips, and a color filter spaced from the light transmitting member and disposed between the light source and the baffle elements.

4,558,402

VEHICLE LAMP ASSEMBLY

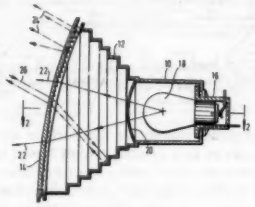
Nicholas W. Tysoe, Worcester, England, assignor to Britax Vega Limited, England

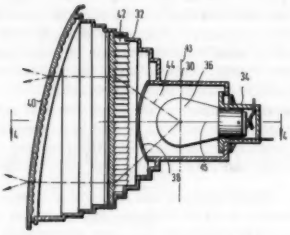
Continuation of Ser. No. 501,013, Jun. 6, 1983, abandoned. This application Oct. 30, 1984, Ser. No. 666,132

Claims priority, application United Kingdom, Jun. 19, 1982, 8217822; Jan. 13, 1983, 8300879

Int. Cl.⁴ F21V *7/00;* **H01G** *5/06*

U.S. Cl. 362—293 **4 Claims**





1. A vehicle lamp assembly having an optical axis and comprising a housing having an inner portion containing a light source, an outer portion closed by an outer lens and including an intermediate element fixedly mounted between the light source and the lens and arranged to collimate light from the light source in a direction substantially parallel to an optical axis of the assembly, the outer portion of the housing being separated from the inner portion by a colour filter which is of smaller area than the outer lens, and the outer portion having a tapering inner surface extending from its narrowest portion adjacent the colour filter to its widest portion adjacent the outer lens, said inner surface comprising a series of alternate first zones and second zones, said second zones being substantially perpendicular to said first zones so that light from outside the lamp which is incident on said first and second zones is reflected back in a direction parallel to its direction of incidence on said zones without passing through the colour filter.

4,558,403

ORNAMENTAL HARNESS WITH LIGHTING EFFECTS

Ulises Llerandi, Naranjo 47-27, Col. Sta., Maria la Ribera, Mexico D.F. 06400

Filed Oct. 24, 1984, Ser. No. 664,387

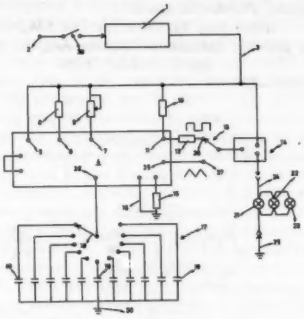
Claims priority, application Mexico, Oct. 25, 1984, 199196

Int. Cl.⁴ F21P *1/02;* **H05B** *37/02*

U.S. Cl. 362—806 **6 Claims**

1. An ornamental harness with lighting effects comprising at least one decorative light transmitting device having a light bulb internally arranged thereto, said light bulb being connected between ground and a current line in turn connected with lighting effects generating means, said lighting effects generating means comprising power supply means, wave generating means connected to said power supply means and

including a square wave generating circuit and a triangular wave generating circuit, ramp generating means connected to said wave generating means, frequency selecting means connected to said wave generating means, waveform selecting means connected to said wave generating means for selecting



between said square wave generating circuit or said triangular wave generating circuit, and power amplifying means connected to said waveform selecting means and to said light bulb of said at least one decorative light transmitting device for supplying amplified current waves to said light bulb.

4,558,404

ELECTROSTATIC PRECIPITATORS

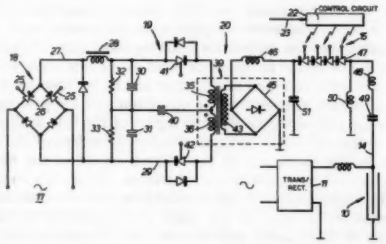
Barry K. James, Solihull, England, assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Apr. 20, 1983, Ser. No. 486,632

Claims priority, application United Kingdom, Apr. 22, 1982, 8211635

Int. Cl.⁴ H02P *13/24*

U.S. Cl. 363—37 **3 Claims**



1. A circuit for supplying voltage pulses to an electrostatic precipitator and comprising a storage capacitor, means for charging the storage capacitor to the desired pulse voltage, a chain of thyristors coupled to the capacitor and adapted to be coupled with the precipitator, and control means for rendering conductive the chain of thyristors to connect the capacitor to the precipitator, said control means including a chain of light emitting diodes, light transmitting means including optical light splitters, control circuits, each of which simultaneously receives a light pulse from said light transmitting means to trigger the thyristors in the chain simultaneously and optical fibres extending between said light emitting diodes and said optical light splitters and between the optical light splitters and said control circuits.

4,558,405

MULTI-LOOP CONTROL SYSTEM FOR AN AC/DC CONVERTER EMPLOYING MODE SWITCHING

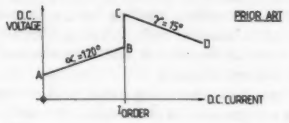
John D. Ainsworth, Stafford, England, assignor to Associated Electrical Industries Limited, England

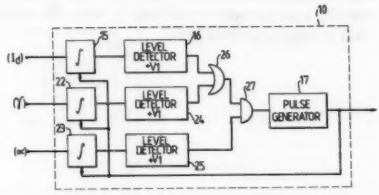
Filed Jan. 31, 1984, Ser. No. 575,516

Claims priority, application United Kingdom, Feb. 9, 1983, 8303551

Int. Cl.⁴ H02P *13/26*

U.S. Cl. 363—81 **8 Claims**





1. A control system for an a.c./d.c. convertor employing phase-controlled valves, the control system comprising an oscillator providing output pulses for determining the phase of firing pulses to said valves, said oscillator including a plurality of integrators, a respective control input for each of said integrators, each said control input being dependent upon an associated operating parameter of the convertor, said oscillator further including level detector means responsive to the output level of each of said integrators for determining the timing of said firing pulses and gate means for selecting from said control inputs in dependence upon the magnitude of said associated operating parameter for controlling, in conjunction with said level detector means, the phase of said firing pulses and maintaining the selected operating parameter constant.

4,558,406

TRANSFORMER FOR GENERATING HIGH DC VOLTAGES WITH INTEGRATED MEANS FOR COOLING RECTIFIERS

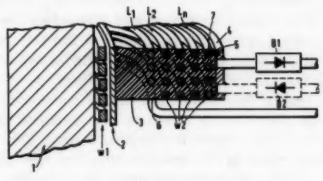
Klaus H. Geissler, Backnang, and Herbert Bock, Oppenweiler, both of Fed. Rep. of Germany, assignors to ANT Nachr'·htentechnik GmbH, Backnang, Fed. Rep. of Germany

Filed Oct. 11, 1983, Ser. No. 540,874

Claims priority, application European Pat. Off., Oct. 8, 1982, 82109306.9

Int. Cl.⁴ H02M *9/00*

U.S. Cl. 363—126 **9 Claims**



1. A transformer arrangement for generating a high DC-

voltage and having an integrated cooling arrangement comprising:

a transformer core;

a primary winding wound around said core;

a metallic shield surrounding said primary winding and being arranged for conducting heat out of said transformer;

a mass of insulation material including an insulation layer surrounding said metallic shield;

at least one secondary winding embedded in said mass of insulation material outside said insulation layer, said at least one secondary winding having an outer circumference and a terminal end carrying a high alternating voltage potential disposed at said outer circumference;

at least one rectifier; and

at least one heat conducting metal band resting on and covering a major portion of the outer circumference of said at least one secondary winding but not constituting a short-circuit winding for said transformer, said terminal end of said at least one secondary winding being connected electrically and thermally with said at least one rectifier via said at least one metal band.

4,558,407

ELECTRICAL SAFETY DEVICE CONTROLLED BY MUTUALLY INDEPENDENTLY GENERATED PULSE TRAINS

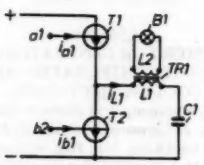
Bengt J. Sterner, Järfälla, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed Dec. 6, 1982, Ser. No. 446,876

Claims priority, application Sweden, Dec. 17, 1981, 8107568

Int. Cl.⁴ H02M 7/537

U.S. Cl. 363—132 **7 Claims**



1. In a railway system having an alternating current utilization device with a winding means, the method of fail-safe energizing the utilization device comprising the steps of connecting a pair of switching means in series across a DC voltage source, connecting one end of said winding means to the junction of the switching means, and connecting the other end of the winding means to a center tap of the DC voltage source, each of said switching means being conductive when receiving a pulse signal, said switching means being arranged such that when one of the switching means is energized current flows through the winding means in one direction and when the other switching means is energized current flows through the winding means in the opposite direction, feeding a first pulse train to one of the switching means and a second pulse train to the other of the switching means, said first and second pulse trains being complementary.

4,558,408

MANUAL CRATE CONTROLLER

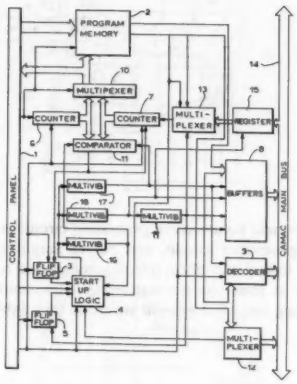
Lyuben P. Atanassov; Eliezer H. Kohen; Vladimir D. Maleshkov, all of Plovdiv; Dimo P. Antonov, Sofia; Lyubomir S. Russev, Plovdiv, and Georgi A. Georgiev, Plovdiv, all of Bulgaria, assignors to Obedineni Zavodi za Zapametyavashti Ustroystva, Plovdiv, Bulgaria

Filed Aug. 18, 1983, Ser. No. 524,365

Claims priority, application Bulgaria, Aug. 18, 1982, 57769

Int. Cl.⁴ G06F 15/46

U.S. Cl. 364—130 **1 Claim**



1. A manual crate controller, consisting of a control station and a working station, comprising a panel, a block of buffers, a decoder and a multiplexor, characterized in that the control station comprises the panel having command outputs connected to a program memory, an output for a cycle connected to the clock of a first D-flip-flop, an output for automatic operation connected to an input of a start-up logic, an output for single action connected to the clock input of a second D-flip-flop, an output for initiation and resetting which, in turn, is connected to a second input of the start-up logic and also to the R-input of the first D-flip-flop, to the resetting input of a first counter, to the resetting input of a second counter, to the input of the block of buffers, to the enable input of the decoder, and the output for entering data from the panel, in turn, is connected to the clock input of the first counter, to the control input of a first multiplexor and to an input for loading the program memory, as for the outputs of the first counter, they are connected to the first inputs of the first multiplexor, the outputs of which are connected to the inputs of the indicators on the panel and to the address inputs of the program memory whose function and subaddress outputs are connected to the corresponding inputs of the block of buffers, further, the outputs for number of the panel are connected to selector inputs of the decoder and to a second multiplexor, the panel output for normal mode being connected to a third input of the start-up logic and to an input of a third multiplexor, while the panel output for repetition mode is connected to a second input of the third multiplexor, whereas buses for accepted command and response of a CAMAC-main bus are connected to the D-inputs of a two-bit register, the outputs of which are connected to the third and the fourth input of the third multiplexor, the output thereof being connected to the clock of the second counter, the second counter having outputs connected to the second inputs of the first multiplexor and to the second inputs of the comparator, the output of which, in turn, is connected to the second resetty TM g input of the first D-flip-flop and to the secon TM resetting input of the second counter, while the outputs of the first and the second D-flip-flops are connected to a fourth and fifth input of the start-up logic, whose sixth input is connected to the output of the second

multiplexor, the second multiplexor having inputs connected to IRQ-buses of the CAMAC-main bus, and the output of the start-up logic being connected to the inputs of monostable multivibrators and also to the input of a delay line with monostable multivibrator, the output of which is connected to the input of a second delay line with monostable multivibrator, whereas the output of a first monostable multivibrator is connected to a seventh input of the start-up logic and to the enable input of the comparator, while the output of a second monostable multivibrator is connected with the second enable input of the comparator and, to the input for busy of the block of buffers and with the second enable input of the decoder, said decoder having outputs connected to buses for number of the CAMAC-main bus, while the output of the first delay line with monostable multivibrator is connected to the clock input of the two-bit register and to the first-strobe input of the block of buffers, and the output of the second delay line with monostable multivibrator is connected to the enable input of the third multiplexor and is further connected to the R-input of the second D-flip-flop and to the second-strobe input of the block of buffers, the outputs of which are connected correspondingly to buses for function, sub-address, initiation, resetting, prohibition, busy, first and second-strobe of the CAMAC-main bus, while the working station comprises a data memory with data inputs connected to data buses of the CAMAC-main bus and an input logic with inputs connected to a main write/read bus, to the buses for busy, initiation, resetting, first and second-strobe of the CAMAC-main bus, while the outputs of the input logic are connected to the control inputs of the data memory, the resetting output in turn, being connected to the resetting input of a third counter, having its clock input connected to the counter output of the input logic, the input logic having its write/read outputs connected to the inputs of an RS-flip-flop, having an output connected to a third monostable multivibrator, whose output is connected, in turn, to the second resetting input of a third counter, the outputs of which are connected to the address input of the data memory.

4,558,409

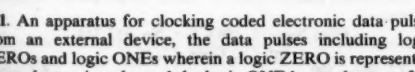
DIGITAL APPARATUS FOR SYNCHRONIZING A STREAM OF DATA BITS TO AN INTERNAL CLOCK

Gary J. Goss, Acton; Robert G. H. Moles, Sudbury, and Randall D. Hinrichs, Belmont, all of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Continuation of Ser. No. 304,754, Sep. 23, 1981, abandoned. This application Nov. 6, 1984, Ser. No. 669,042

Int. Cl.⁴ H04L *7/08;* **G06F** *5/04*

U.S. Cl. 364—200 **6 Claims**



1. An apparatus for clocking coded electronic data pulses from an external device, the data pulses including logic ZEROs and logic ONEs wherein a logic ZERO is represented by an electronic pulse and the logic ONE by an absence of an electronic pulse and the apparatus generating clock signals normally including a predetermined plurality of time intervals of predetermined duration established by signals defining the time intervals, said apparatus including means for synchronizing the clock signals with the data pulses comprising:

first means for receiving the signals defining the time intervals and for generating clock pulses therefrom, each clock pulse including a plurality of time intervals;

second means for receiving the data pulses from said external device and for generating a first signal indicative of a logic ZERO data pulse received from the external device;

third means coupled to said first means and said second means for synchronizing the clock pulses with the data pulses; and

fourth means coupled to said first means, said second means and said third means and controlling the first means for varying the duration of a clock pulse from the first means by varying the time invervals in the clock pulse when the time interval in which a first signal indicative of the data pulse received from said external device varies from a predetermined time interval of the clock pulses.

4,558,410

MICROCOMPUTER SYSTEM FOR HIGH-SPEED LOCATION OF BLOCKS OF CHARACTERISTICS

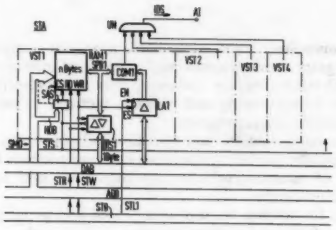
Peter Holzner, Germering, and Werner Sedlmeier, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jan. 26, 1982, Ser. No. 342,897

Claims priority, application Fed. Rep. of Germany, Feb. 11, 1981, 3104941

Int. Cl.⁴ G06F *9/00*

U.S. Cl. 364—200 **7 Claims**



1. In a microcomputer system for data processing and for searching multi-byte characteristic blocks, said microcomputer system having a working store with an area for storing data with a width of an integral number "a" bytes, said working store having a data file area for storing characteristic blocks having a data width of an integral number "b" bytes, where "b" is an integral multiple of "a", said multicomputer system having a DMA controller, and bus means including a data bus and an address bus interconnecting said DMA controller and said working store, the combination comprising;

a plurality of comparator units, the number of which is equal to the ratio of "b"/"a";

a plurality of read-write stores, the number of which is equal to the ratio of "b"/"a"; one of said read-write stores for each of said comparator units, each of said read-write stores containing a data file area for an integral number "a" bytes of a characteristic block, said integral number "a" bytes being stored under the same relative address in each read-write store;

each comparator unit having means for receiving inputs with a data width of "a" bytes corresponding to the characteristic block being searched for;

a storage bus connecting a second input of said comparator unit to its associated read-write store;

a bus separation stage connecting said storage bus to said data bus;

means for switching said bus separation stage to a high-impedence mode during operation of said comparator unit (during a searching process);

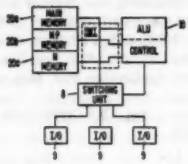
a searching mode address control unit for each said comparator stage for simultaneously reading out all of the bytes of a characteristic block from said integral number "b"/"a" read-write stores; and

an analysis circuit connected to the output of all of said comparator units for producing a match identity signal when all said comparator units recognize equality between the characteristic block being searched for and the data read from said read-write stores.

4,558,411
POLYMORPHIC PROGRAMMABLE UNITS EMPLOYING PLURAL LEVELS OF SUB-INSTRUCTION SETS

Ulbe Faber, Honeybrook; Robert L. Davis, Downington; David A. Fisher, Pittsburgh, and Joseph D. McGonagle, Media, all of Pa., assignors to Burroughs Corp., Detroit, Mich.

Filed May 19, 1969, Ser. No. 825,569
Int. Cl.[4] G06F *9/00*
U.S. Cl. 364—200 **1 Claim**



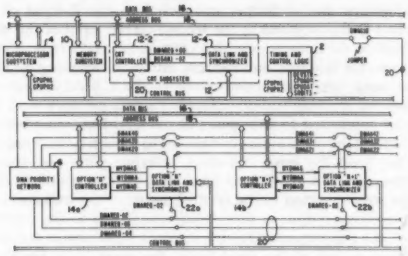
1. A microinstruction controllable processor comprising:
a program memory containing a series of microprograms, each microprogram containing a set of microinstructions;
means for addressing said program memory to provide an operative microprogram;
means controlled by said operative microprogram for sequentially providing operative microinstructions from the set of microinstructions associated with said addressed microprogram;
means for writing microprograms into said program memory of selected address locations therein; and
means controlled by a processor control field of said provided operative microinstruction for providing signals to control the processor;
said program memory addressing means including a second memory separate from said program memory the individual words of which are selected by said program memory and communicated to said program memory addressing means under control of a provided operative microinstruction; and
means controlled by said operative microinstruction for enabling said program memory write means so as to selectively change certain ones of said microprograms.

4,558,412
DIRECT MEMORY ACCESS REVOLVING PRIORITY APPARATUS

Minoru Inoshita, Glendale, Ariz., and Gerald N. Winfrey, Billerica, Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Continuation of Ser. No. 318,097, Nov. 4, 1981, abandoned, which is a continuation of Ser. No. 973,196, Dec. 26, 1978, abandoned. This application Dec. 1, 1983, Ser. No. 557,379
Int. Cl.[4] G06F *13/00, 3/04*
U.S. Cl. 364—200 **6 Claims**

1. A terminal system comprising:
a system bus including an address bus, a data bus and a control bus;
memory means coupled to said system bus;
timing means coupled to said control bus for generating timing control signals to divide the timing of said address bus and said data bus into distinct central processing unit (CPU) cycles and a plurality of distinct direct memory access (DMA) cycles and for generating a repeating sequence of a plurality of distinct DMA signals on said control bus, each of said plurality of DMA signals in a first state corresponding to one of said plurality of distinct DMA cycles and indicating the occurrence of said corresponding DMA cycle;
a plurality of peripheral subsystems coupled to said system bus for transferring data to and from said memory means, each of said plurality of peripheral subsystems having jumper means for coupling to a selected one of said plurality of distinct signals for transferring data signals during the distinct DMA cycle corresponding to said one of said plurality of DMA signals, at least one of said plurality of DMA signals having a plurality of common cycle peripheral subsystems coupled thereto in a daisy chain fashion, each of said plurality of common cycle peripheral subsystems coupled to said at least one of said plurality of DMA signals having priority resolution means for determining that said one of said plurality of common cycle peripheral subsystems may be granted access to said system bus for transferring said data signals between said memory subsystem and said one of said plurality of common cycle peripheral subsystems, and having requesting means for requesting access to said system bus, said priority resolution means and said requesting means being coupled in a



first mode of operation to enable said one of said plurality of commmon cycle peripheral subsystems to retain access to said system bus on successive ones of said corresponding DMA cycles despite requests for access from others of the plurality of common cycle peripheral subsystems, and being coupled in a second mode of operation to enable another one of said plurality of common cycle peripheral subsystems requesting a data transfer to obtain access to said system bus on a subsequent one of said corresponding DMA cycles and, by response of the priority resolution means of said one of said plurality of common cycle peripheral subsystems to a request for access by said another one of said plurality of common cycle peripheral subsystems, prevent said one of said plurality of common cycle peripheral subsystems from retaining access to said system bus.

4,558,413
SOFTWARE VERSION MANAGEMENT SYSTEM

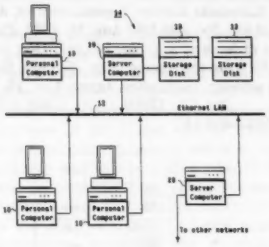
Eric E. Schmidt, Los Altos, Calif., and Butler W. Lampson, Philadelphia, Pa., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 21, 1983, Ser. No. 553,724
Int. Cl.[4] G06F *15/20*
U.S. Cl. 364—300 **6 Claims**

1. A software version management system for automatically collecting and recompiling updated versions of component software objects comprising a software program for operation on a plurality of personal computers coupled together in a distributed software environment via a local area network and wherein said objects include the source and binary files for various of said software program and are stored in various different local and remote storage means through said environment, said component software objects being periodically updated via environment editing means by various users at said personal computers and stored in designated storage means, said system including:
models comprising system objects,
each of said models representative of the source versions of a particular component software object,

each of said models containing object pointers including a unique name of the object, a unique identifier descriptive of the cronological updating of its current version, information as to an object's dependencies on other objects and a pathname representative of the residence storage means of the object,

means in said editing means to notify said management system when any one of said objects is being edited by a user,



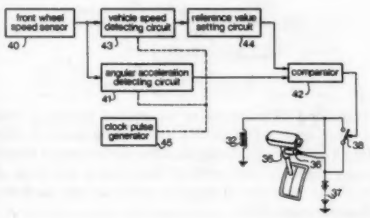
means in said management system in response to notification of object editing to track said edited objects and alter their respective models to the current version thereof,

said management system upon command adapted to retieve and recompile said source files corresponding to said altered models and load the binary files of said altered component software objects and their dependent objects into said computers.

4,558,414
SYSTEM FOR CONTROLLING A POWER TRANSMISSION OF A FOUR-WHEEL DRIVE VEHICLE

Ryuzo Sakakiyama, Tokyo, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 12, 1983, Ser. No. 484,330
Claims priority, application Japan, Apr. 14, 1982, 57-63009
Int. Cl.[4] B60K *17/34, 23/08*
U.S. Cl. 364—424.1 **7 Claims**



1. In a system for controlling a power transmission of a four-wheel drive vehicle powered by an engine, the vehicle having a transmission for transmitting the power of said engine to main wheels of the vehicle, a clutch for selectively simultaneously transmitting said power to auxiliary wheels of the vehicle, and sensing means for sensing speed of said main wheels for producing output signals in dependency on the speed, the improvement comprising:

first computing circuit means for computing vehicle speed from output signals of said sensing means and producing a vehicle speed signal;

second computing circuit means for computing angular acceleration from the output signals of said sensing means and for producing an actual angular acceleration signal;

means responsive to first computing circuit means for providing a reference angular acceleration signal which decreases as vehicle speed increases;

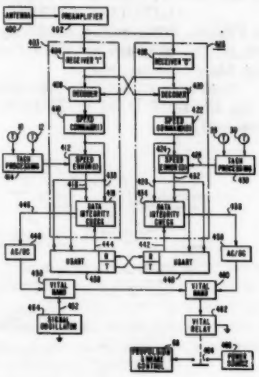
comparing circuit means for comparing the actual angular acceleration signal with said reference angular acceleration signal and for producing a slipping signal when the actual angular acceleration signal is higher than the reference angular acceleration signal; and

switch means responsive to said slipping signal of said comparing circuit means for engaging said clutch, whereby four-wheel driving power transmission is established.

4,558,415
VEHICLE SPEED CONTROL APPARATUS AND METHOD

Pierre A. Zuber, Baldwin, and Habib Dadpey, Upper St. Clair, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 20, 1983, Ser. No. 496,693
Int. Cl.[4] G05D *13/62;* **G06F** *15/16, 15/48*
U.S. Cl. 364—426 **9 Claims**



1. In apparatus for controlling the speed of a vehicle having a propulsion motor and moving along a track providing to the vehicle an input speed command having first and second information components, the combination of:

means responsive to the actual speed of the vehicle along said track;

first means responsive to the first information component to provide a first speed command;

second means responsive to the second information component to provide a second speed command;

means including a dynamic serial link for providing the first speed command to the second means and for providing the second speed command to the first means;

said first means establishing a predetermined relationship between the first speed command and the second speed command to provide a first output signal to control the energization of the propulsion motor when said predetermined relationship is present between the first and second speed commands; and

said second means establishing a predetermined relationship between the second speed command and the first speed commond to provide a second output signal to control the energization of the propulsion motor when said predetermined relationship is present between the second and first speed commands.

6. The method of controlling a vehicle having a propulsion motor and moving along a track providing to the vehicle a desired speed signal having first and second information components, including the steps of:

determining the actual speed of the vehicle;

providing a first speed command in a first information component channel;

providing a second speed command in a second information component channel;

sending the first speed command dynamically to the second information component channel for comparison with the second speed command to provide a first output signal when a predetermined relationship is established between the first and second speed commands;

sending the second speed command dynamically to the first information channel for comparison with the first speed command to provide a second output signal when said predetermined relationship is established between the first and second speed commands; and

controlling the operation of said propulsion motor in response to the first and second output signals.

4,558,416

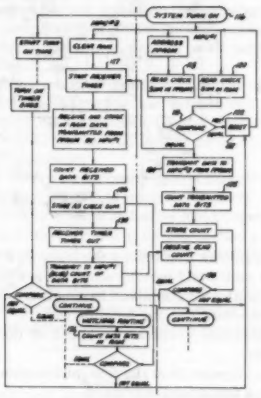
METHOD FOR MAINTAINING THE INTEGRITY OF A DUAL MICROPROCESSOR MULTIPROCESSING COMPUTING SYSTEM

Michael A. Pauwels, Williamsburg, and Danny O. Wright, Grafton, both of Va., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed May 27, 1983, Ser. No. 499,115

Int. Cl.[4] G06F *11/30, 15/16;* **F02D** *37/02*

U.S. Cl. 364—431.11 **3 Claims**



1. A method for maintaining the integrity of a dual microprocessor multiprocessing computing system having a removable programmable read only memory with an identifying check sum contained therein, the programmable read only memory containing data for tailoring the computing system to a dedicated system, comprising the steps of:

initiating in the second microprocessor and in response to an initializing signal, a timing period having a predetermined time length;

transmitting bit signals from the programmable read only memory through the first microprocessor to the second microprocessor;

counting the number of bit signals being transmitted from the first microprocessor;

counting the number of bit signals being received in the second microprocessor within said time period for generating a received check sum;

comparing the predetermined number with the received check sum; and then

proceeding with the operation of the multiprocessing computing system when the received check sum and the predetermined number are equal and reinitializing the system after the end of the timing period if the received check sum and the predetermined number are unequal.

4,558,417

COMPUTER BASED ENGINE CONTROL WITH LOWER PRIORITY INTERRUPT REQUESTS GENERATED IN SELECTED HIGHER PRIORITY INTERRUPT ROUTINES

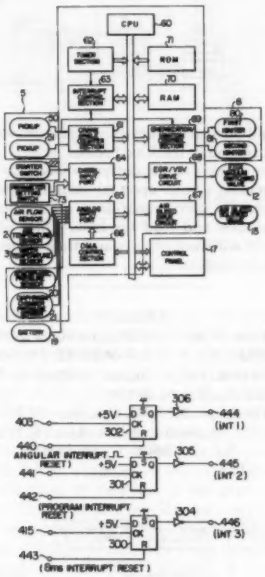
Susumu Akiyama, Kariya; Kenzo Ito, Okazaki; Hiroyasu Fukaya, Nagoya; Haruhiko Ogiso, Kariya; Yuji Hirabayashi, Aichi, and Takahide Kawamura, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Division of Ser. No. 409,349, Aug. 18, 1982, Pat. No. 4,476,532, which is a division of Ser. No. 103,942, Dec. 14, 1979, Pat. No. 4,347,570. This application May 25, 1984, Ser. No. 614,243

Claims priority, application Japan, Dec. 18, 1978, 53-157782

Int. Cl.[4] G05B *15/02;* **G06F** *9/46*

U.S. Cl. 364—431.11 **4 Claims**



1. A method of controlling an engine having a rotatable output shaft, an electric device and a programmed computer including a central processing unit for performing a plurality of processing routines, said method comprising the steps of:

providing a plurality of angular pulses during each rotation of said output shaft;

counting the number of said angular pulses;

generating angular interrupt requests in synchronism with said angular pulses;

initiating, in response to said angular interrupt requests, angular interrupt routines of the highest priority in said central processing unit of said programmed computer irrespective of execution status thereof to control said electric device in accordance with control data calculated by said central processing unit of said programmed computer;

generating program interrupt requests during selected angular interrupt routines when the counted number of said angular pulses reaches predetermined values, said program interrupt requests having lower priority than said angular interrupt requests; and

initiating, in response to said program interrupt requests, program interrupt routines of lower priority than said angular interrupt routines to calculate said control data for said electric device in accordance with operating

parameters of said engine, said programmed interrupt routines being executed after completing said selected angular interrupt routines but before any other routines except for said angular interrupt routines.

4. An apparatus for controlling an engine having a rotatable output shaft and an electric device, said apparatus comprising:

sensor means for providing a plurality of angular pulses during each rotation of said output shaft;

counter means for counting the number of said angular pulses;

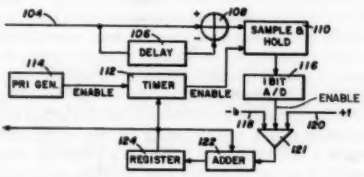
means for generating angular interrupt requests in synchronism with said angular pulses; and

central processing means for performing a plurality of processing routines, said processing means also for: (1) initiating, in response to said angular interrupt requests, angular interrupt routines of the higest priority irrespective of execution status of said processing means to control said electric device in accordance with a control data calculated by said processing means, (2) generating program interrupt requests during selected angular interrupt routines when the counted number of said angular pulses reaches predetermined values, said program interrupt requests having lower priority than said angular interrupt requests, and (3) initiating, in response to said program interrupt requests, program interrupt routines of lower priority than said angular interrupt routines to calculate said control data for said electric device in accordance with operating parameters of said engine, said programmed interrupt routines being executed after completing said selected angular interrupt routines but before any other routines except for said angular interrupt routines.

4,558,418
LEADING EDGE ESTIMATOR FOR NAVIGATION SYSTEM

Larry R. Keearns, Dallas, Tex., assignor to E-Systems, Inc., Dallas, Tex.

Division of Ser. No. 248,803, Mar. 30, 1981, Pat. No. 4,495,580. This application May 5, 1983, Ser. No. 491,925
Int. Cl.[4] G06F *15/50*
U.S. Cl. 364—450 **4 Claims**



1. A leading edge estimator for a vehicle terrain navigation system having a radar terrain sensor which generates a position signal, comprising:

storage means for storing a time of arrival signal estimate;

delay means for receiving said position signal from said radar terrain sensor and producing a delayed version thereof;

difference means for receiving said position signal and said delayed version thereof, and in response thereto generating a difference signal;

sampling means connected to said difference means for generating a sample of said difference signal;

conversion means for receiving said difference signal sample and in response thereto generating an enable signal;

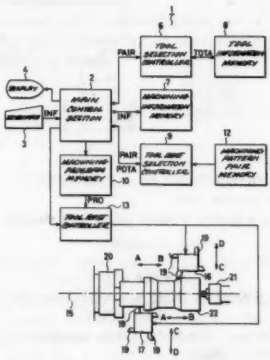
gating means responsive to said enable signal for selecting one of two predetermined weighting factors; and

adder means, connected to receive said weighting factor selected by said gating means, for summing said weighting factor with said time of arrival signal estimate to generate an up-dated time of arrival signal estimate.

4,558,419
METHOD OF JUDGING AND CONTROLLING SIMULTANEOUS MACHINING IN A QUADRIAXIAL NUMERICAL CONTROL LATHE

Hiroyuki Kanematsu, Konan; Akimitsu Nagae, Kasugai, and Shinji Sano, Konan, all of Japan, assignors to Yamazaki Machinery Works, Ltd., Japan

Filed Mar. 4, 1983, Ser. No. 472,252
Claims priority, application Japan, Mar. 11, 1982, 57-39211
Int. Cl.[4] G06F *15/46*
U.S. Cl. 364—474 **20 Claims**



1. In a quadriaxial numerical control lathe having two tool rests each tool rest carrying a plurality of tools for machining a workpiece and capable of being driven independently so as to machine a workpiece either simultaneously with tools of respective tool rests or non-simultaneously, a method of controlling machining comprising the steps of:

storing in a machining pattern pair memory a pair table having data indicating which of various pairs of machining patterns, belonging to various machining modes, can be simultaneously machined;

inputting machining information which defines pairs machining patterns which could be advantageously simultaneously carried out;

accessing said machining pattern pair memory and determining which of the simultaneous machining patterns based upon the inputted machining information are possible;

generating a machining program including instructions for simultaneously machining those patterns which are judged to be possible in said accessing step; and

controlling said tool rests in accordance with said program.

4,558,420
COMPUTER GENERATED MOLD FOR CONTOURED GARMENT PIECE FORMATION

Heinz J. Gerber, West Hartford, Conn., assignor to Gerber Scientific Inc., South Windsor, Conn.

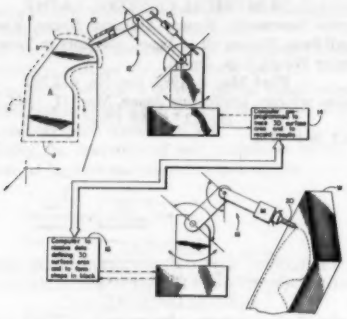
Filed Oct. 25, 1982, Ser. No. 436,701
Int. Cl.[4] G06F *15/46*; G05B *19/42*
U.S. Cl. 364—476 **7 Claims**

4. A process for the manufacture of garments or the like from three dimensionally molded pattern pieces and comprising;

(a) tracing a three dimensional object or person to be fitted in a predetermined pattern with movable transducer means to generate a data bank defining said object or person's three dimensional shape,

(b) processing the data of said bank in a computer which has been programmed to direct a workpiece shaping tool,

(c) shaping a workpiece with said shaping tool under the direction of said computer to provide a three dimensional



surface corresponding to a predetermined area of said object or person, and

(d) molding a garment piece using said shaped workpiece.

4,558,421

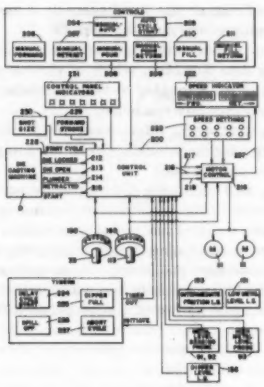
CONTROL SYSTEM FOR AN AUTOMATIC LADLING APPARATUS

Ronald D. Shriver, Pataskala, Ohio, assignor to Yellowstone, Ltd., Columbus, Ohio

Continuation-in-part of Ser. No. 502,753, Jun. 9, 1983, abandoned. This application Jun. 4, 1984, Ser. No. 616,906

Int. Cl.[4] G06G *7/66*

U.S. Cl. 364—477 **14 Claims**



1. A control system for a ladling apparatus for ladling molten metal from a reservoir to a casting apparatus horizontally spaced from the reservoir, the ladling apparatus having a ladle transport assembly capable of moving horizontally between the reservoir and the casting apparatus, the ladle dipper capable of tilting to pour molten metal into the casting apparatus, the control system comprising:

means for moving the ladle transport assembly from the metal reservoir to the casting apparatus at varying speeds;

means for tilting the ladle dipper at varying speeds when the ladle transport assembly is at the casting apparatus to pour molten metal into the casting apparatus;

adjustable means for setting a plurality of individual speeds;

means for selecting one of the plurality of speeds;

means for supplying the selected speed from the selecting means to the moving and the tilting means;

means for controlling the selecting means in response to predetermined inputs.

4,558,422

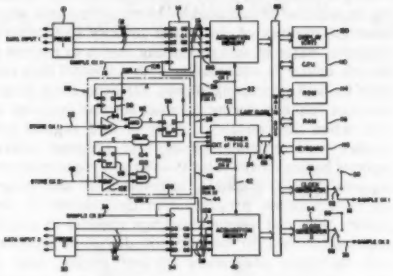
DIGITAL SIGNAL SAMPLING SYSTEM WITH TWO UNRELATED SAMPLING TIMEBASES

Steven C. DenBeste, Beaverton; Douglas G. Boyce, Aloha; John D. Blattner, Beaverton, and Kenneth K. Hillen, Aloha, all of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Mar. 23, 1983, Ser. No. 478,608

Int. Cl.[4] G06F *15/20*

U.S. Cl. 364—480 **20 Claims**



1. A signal sampling system, comprising:

first sampling means for sampling a first data signal when first sampling pulses are applied thereto to produce first data sample output signals;

second sampling means for sampling a second data signal which may be the same as or different from said first data signal, when second sampling pulses of a different timebase than said first sampling pulses are applied thereto to produce second data sample output signals; and

timebase correlation means for generating a first time correlation signal output corresponding to the first sampling pulses and a second time correlation signal output corresponding to the second sampling pulses;

said first and second correlation signals each being produced by the correlation means with at least two different logic levels, including for the first correlation signal a first logic level if there is a sample pulse, and a second logic level if there is no sample pulse, of the second sampling pulses between the current and previous sample pulses of the first sampling pulses, and including for the second correlation signal a first logic level if there is a sampling pulse, and a second logic level if there is no sampling pulse, of the first sampling pulses between the current and previous sample pulses of the second sampling pulses.

4,558,423

UTILIZATION OF AN ASTM END POINT TEMPERATURE FOR CONTROLLING A FRACTIONAL DISTILLATION PROCESS

Gyan P. Jain, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 27, 1983, Ser. No. 498,997

Int. Cl.[4] G06F *15/46*

U.S. Cl. 364—501 **11 Claims**

1. Apparatus comprising:

a fractional distillation column means;

means for providing a feed stream to said fractional distillation column means;

a cooling means;

an overhead accumulator means;

means for withdrawing an overhead vapor stream from an upper portion of said fractional distillation column means

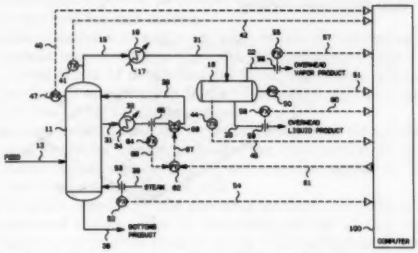
and for passing said overhead vapor stream through said cooling means to said overhead accumulator means;

means for withdrawing a liquid stream from said overhead accumulator means as an overhead liquid product;

means for providing an upper external reflux to said fractional distillation column means;

means for establishing a first signal representative of the slope of the equilibrium flash vaporization boiling point line for said overhead liquid product at a time T_2;

means for establishing a second signal representative of the actual slope of the ASTM boiling point curve for said overhead liquid product at said time T_2 in response to said first signal;



means for establishing a third signal representative of the actual ASTM end point temperature for said overhead liquid product in response to said second signal;

means for establishing a fourth signal representative of a desired ASTM end point temperature for said overhead liquid product;

means for comparing said third signal and said fourth signal and for establishing a fifth signal which is responsive to the difference between said third signal and said fourth signal; and

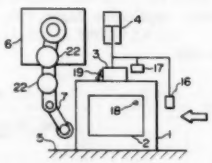
means for manipulating the flow rate of said upper external reflux to said fractional distillation column means in response to said fifth signal.

4,558,424

ROBOT CONTROL APPARATUS

Yukio Oguchi, and Kazuyoshi Yasukawa, both of Nagano, Japan, assignors to Kabushiki Kaisha Sankyo Seiki Seisakusho, Nagano, Japan

Filed Sep. 23, 1982, Ser. No. 422,493
Int. Cl.⁴ G06F *15/46*
U.S. Cl. 364—513 **7 Claims**



1. A robot control apparatus for moving an arm of a robot with respect to a workpiece supported on a pallet comprising:

reference position memory means for storing a reference position;

means for positioning said pallet with respect to a reference surface;

horizontal and vertical position detecting means for detecting a position of a reference marker positioned on a predetermined one of said pallet and said workpiece, in response to an output signal generated by said positioning means;

work position memory means for storing a plurality of data values representing a locus of movement of an arm of said robot;

comparator means for determining a difference between an output of said position detecting means representing said position of said reference marker and said reference position as supplied by said reference position memory means and for correcting said data values upon being output from said work position memory means in accordance with said difference; and

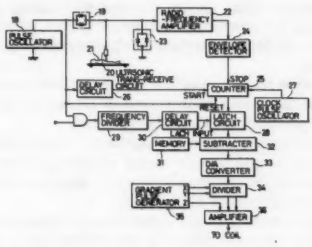
robot control means for positioning said arm of said robot in accordance with the corrected data values provided by said comparator means.

4,558,425

NMR IMAGING APPARATUS OF CHANGEABLE INSPECTING ZONE SIZE

Etsuji Yamamoto; Kensuke Sekihara, both of Hachioji; Hideki Kohno, Suginami, and Shinji Yamamoto, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 1, 1982, Ser. No. 413,821
Claims priority, application Japan, Sep. 4, 1981, 56-138572
Int. Cl.⁴ G01N *15/00*
U.S. Cl. 364—555 **17 Claims**



1. An imaging apparatus using nuclear magnetic resonance, comprising:

field generation means for generating a static magnetic field, a linear gradient magnetic field and a radio frequency magnetic field, respectively, and for exciting nuclear spins in an object to be inspected so as to produce a nuclear magnetic resonant signal when said object is located in a magnetic field having a predetermined spatial gradient;

signal detection means for detecting the nuclear magnetic resonant signal which is indicative of a projection of a nuclear spin distribution in said object to be inspected;

a computer responsive to said signal detection means for calculating an imaging signal;

output means for displaying the imaging signal from said computer; and

control signal generation means for generating a control signal for controlling the intensity of said linear gradient magnetic field, said control signal having a value indicative of the size of said object to be inspected;

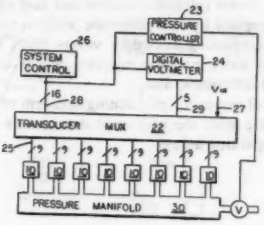
said linear gradient magnetic field generation means being responsive to said control signal generation means for providing said predetermined spatial gradient corresponding to said control signal.

4,558,426

TRANSDUCER MULTIPLEXER

Clarence R. Solt, Jr., Gardena, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Dec. 14, 1983, Ser. No. 561,307
Int. Cl.[4] G06F *11/00*
U.S. Cl. 364—580 **9 Claims**



1. A transducer multiplexer device for controlling the testing of a multiplicity of bridge type transducers connected to loading means capable of applying a variety of known loads to the transducers, the device being under the control of a separate operator controlled command unit, the device connected thereto by bus means and providing output signals from the transducers to a separate precision voltmeter means and the command unit, the device comprising:

bus interface means which translate bus commands into system commands for the device;

device microprocessor means which receive system commands from the bus interface means and provide output commands to channel selection means, bridge leg selection means and calibration resistor selection means, the microprocessor means also communicating with RAM means for temporary storage of system information and with ROM means which hold a system operating program;

calibration resistor selection means responsive to commands from the device microprocessor means which select one of a plurality of calibration resistors;

bridge leg selection means responsive to commands from the device microprocessor means which select one of the legs of one of the transducers to which the selected calibration resistor is applied in parallel;

channel selection means responsive to commands from the device microprocessor means which select one of the transducers for testing in conjunction with the loading means or in conjunction with calibration resistor and bridge leg selection means; and

output means providing signals representing the response of the transducers to the loading means testing and to the calibration resistor testing such that all signals are uniquely identified to the particular transducer which produced the respective signals, such signals being supplied to the precision voltmeter means and to the operator controlled command unit.

4,558,427

SHEET-LIKE COMPACT ELECTRONIC EQUIPMENT

Eiichi Takeuchi, Iruma, and Kazuya Hara, Tokyo, both of Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Filed Feb. 22, 1983, Ser. No. 468,401
Claims priority, application Japan, Mar. 3, 1982, 57-33272; Mar. 3, 1982, 57-33273; Mar. 3, 1982, 57-33274
Int. Cl.[4] G06F *15/02*
U.S. Cl. 364—708 **16 Claims**

1. A sheet-like compact electronic device, comprising:

an electronic parts assembly including

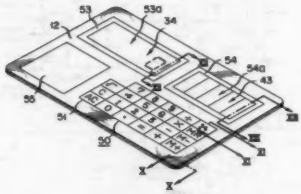
a flexible board including switching contacts and having a predetermined wiring pattern thereon,

a semiconductor integrated circuit chip disposed on said board and electrically connected to said wiring pattern,

a display unit disposed on said board and electrically connected to said semiconductor integrated circuit chip through said wiring pattern, said display unit being adapted to display data visually in accordance with an output signal from said semiconductor integrated circuit chip, and

a dry cell disposed on said board and electrically connected to said semiconductor integrated circuit chip through said wiring pattern, said dry cell being adapted to apply a drive voltage across said semiconductor integrated circuit chip, and said display unit and said dry cell being connected to said flexible board such that they are substantially on the same plane with said flexible board; and

case means comprising



upper cover means made of a flexible material and in tight contact with an upper surface of said electronic parts assembly, said upper means being provided with a key indicia portion opposing said switching contacts on said board so as to allow an operator to perform a key operation, and with a transparent display window opposing said display section,

lower cover means having a sheet-like flat lower surface, and in tight contact with a lower surface of said electronic parts assembly, and

adhesive means provided between said upper cover means and said lower cover means for adhering the two together;

wherein said case means stores said electronic parts assembly therein such that said upper and said lower cover means sandwich said electronic parts assembly therebetween.

4,558,428

DATA TRANSMISSION SYSTEM ADAPTED TO FACILITATE DETECTION OF SAFE RECEIPT OF A TRANSMITTED DATA FRAME BY A RECEIVING STATION

Hisashi Matsumura, Hadano; Toyokazu Hashimoto, Kanagawa; Masahiko Kida, and Hiroyuki Wada, both of Hadano, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 2, 1982, Ser. No. 344,977
Claims priority, application Japan, Feb. 3, 1981, 56-14571
Int. Cl.[4] G06F *11/08, 11/16*
U.S. Cl. 364—900 **6 Claims**

ITEM	L.A. PATTERN	CONTENTS OF RESPONSE
1	00010010	THE FRAME HAS NOT BEEN RECEIVED DUE TO CRC ERROR OR R-ST DOWN.
2	00100100	THE FRAME HAS NOT BEEN RECEIVED BECAUSE THE BUFFER AT R-ST IS FULLY OCCUPIED.
3	01001000	THE FRAME HAS BEEN RECEIVED NORMALLY.

1. A data transmission system comprising a loop transmission path for transmitting signals representing a frame of data and a plurality of data stations connected to the transmission path and having respective addresses within the system, each of said stations comprising:

means for generating signals representing a frame of data including a data portion, an answer information portion, a sending-station address portion and a receiving-station address portion;

means for sending out said signals representing the frame of data produced by said generating means to said loop transmission path with said data portion being positioned in advance of said answer portion;

means for receiving signals representing a frame of data transmitted on said loop transmission path and for retransmitting the received signals representing the entire frame of data on said loop transmission path;

means for comparing the address of the station with the receiving-station address portion of the received frame of data received in the form of said signals on said loop transmission path to determine whether the frame of data is destined for said station;

means responsive to said comparing means for storing said signals representing at least the data portion of said received frame of data when the receiving-station address portion of said received frame of data coincides with the address of the receiving-station;

checking means connected to said receiving and retransmitting means for checking at least the data portion of said frame of data represented by said received signals to detect abnormalities therein; and

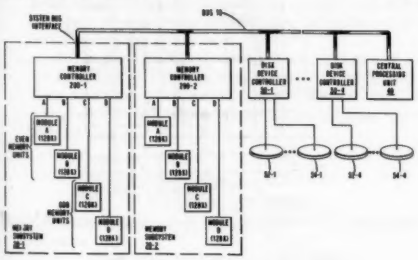
first means coupled to said checking means for altering said received signals prior to retransmission by setting the answer information portion of the received frame of data to one of a plurality of selected code patterns depending on whether or not said received frame of data has been normally received in said storage.

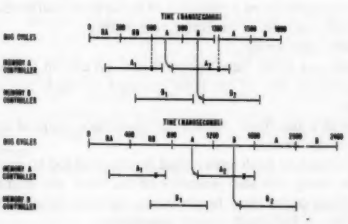
4,558,429

PAUSE APPARATUS FOR A MEMORY CONTROLLER WITH INTERLEAVED QUEUING APPARATUS

George J. Barlow, Tewksbury; Chester M. Nibby, Jr., Peabody, and Robert B. Johnson, Billerica, all of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Dec. 17, 1981, Ser. No. 331,933
Int. Cl.[4] G06F *9/00*
U.S. Cl. 364—900 30 Claims





1. A data processing system comprising a number of memory command generating units and a plurality of memory subsystems each of which connect to a bus, each subsystem including a controller for controlling the operation of a number of memory module units coupled to said controller in response to a number of different types of memory requests, said controller including queue circuit means for storing and processing said memory requests received from said plurality of memory command generating units, each of said controllers further including:

bus control circuit means coupled to said bus for generating signals for transferring data words during bus cycles of operation; and,

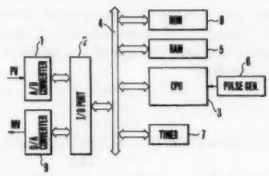
pause control circuit means coupled to said queue circuit means, to said bus and to said bus control circuit means, said pause control circuit means including means for monitoring the activity of said bus, said monitoring means being operative to generate an output signal upon detecting a predetermined type of bus activity, said bus control circuit means being conditioned by said output signal to lengthen the time between successive bus cycles occurring during a predetermined type of data transfer operation carried out in response to the processing of a specific type of one of said memory requests for enabling said plurality of command generating units to access said queue circuit means when available for processing new requests in parallel with said predetermined type of data transfer operation.

4,558,430

CONTROLLER OF DIGITAL CONTROL SYSTEM AND METHOD FOR CONTROLLING THE SAME

Takeo Mogami, Fujisawa, and Michio Saeki, Yokohama, both of Japan, assignors to Yamatake-Honeywell Co., Ltd., Tokyo, Japan

Filed Oct. 5, 1982, Ser. No. 432,970
Claims priority, application Japan, Oct. 5, 1981, 56-148471[U]
Int. Cl.[4] G06F *15/46;* G05B *13/02*
U.S. Cl. 364—900 2 Claims



1. A controller of a digital control system comprising:

a first memory device for storing a program,

a second memory device for storing a program pattern consisting of a plurality of continuous time segments whose set point variables correspond to the time segments,

a third memory device for storing a plurality of PID parameters;

a timer for measuring elapsed time for each time segment; and

arithmetic operation means operating according to said program, said arithmetic operation means measuring a process variable, means for reading out a set point variable corresponding to said time segment at a measuring point from said second memory device, means for determining the deviation between the measured process variable and said read out set point variable to calculate error data, means for reading out a PID parameter corresponding to a time segment at said measuring point from said third memory device for performing a PID control calculation based on said read out PID parameter and said error data so as to produce a manipulated value for varying said

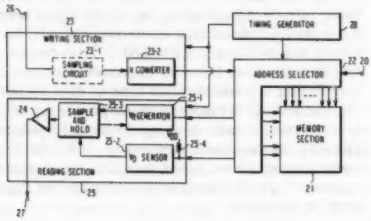
process variable in accordance with a result of said calculation, thereby controlling said process variable in accordance with said set point variable.

4,558,431

MEMORY SYSTEM FOR STORING ANALOG INFORMATION

Noboru Satoh, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Dec. 12, 1983, Ser. No. 560,308
Claims priority, application Japan, Dec. 10, 1982, 57-216701
Int. Cl.[4] G11C *11/40*
U.S. Cl. 365—45 **15 Claims**



1. A memory system for storing analog information comprising a memory section including a plurality of non-volatile, insulated-gate field-effect memory transistors, the threshold voltage of said memory transistor being changed continuously in response to the gate voltage thereof so long as said gate voltage is within a predetermined voltage range, an input terminal for receiving an input signal having said analog information, a voltage converter converting said input signal to have a voltage within said predetermined voltage range, a first means for applying said converted input signal to a selected first one of said memory transistors to change the threshold voltage of the selected first memory transistor in accordance the voltage of said converted input signal, and a second means for reading the analog information stored in said memory transistors, said second means including means for detecting the changed threshold voltage of a selected second one of said memory transistors.

4,558,432

NON-VOLATILE SEMICONDUCTOR MEMORY CIRCUITS

Colin W. Edwards, Gerrards Cross, and Kenelm C. G. Murray, Chiddingfold, both of England, assignors to Hughes Microelectronics Limited, Glenrothes, Scotland

Filed Aug. 24, 1982, Ser. No. 411,131
Claims priority, application United Kingdom, Aug. 25, 1981, 8125919
Int. Cl.[4] G11C *11/40*
U.S. Cl. 365—154 **11 Claims**

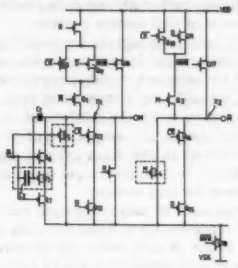
1. A non-volatile semiconductor memory circuit comprising:

a common supply voltage,

a pair of cross-coupled branches connectable across said common supply voltage, each branch including a driver and a complementary driver connected in series at an output node in which one of the complementary drivers includes a floating gate field effect, variable threshold transistor having a control gate and whose threshold voltage may be varied so as to store data in the circuit, the current through said variable threshold transistor at a given potential on its control gate varying between upper and lower values in dependence on said threshold voltage,

said complementary driver in the other branch including a fixed threshold reference transistor having a control gate, with the current through said reference transistor being intermediate the upper and lower values at said same given potential at its control gate, and

a shunt transistor coupled in parallel with the complementary driver which includes said variable threshold transistor, said shunt transistor having a control gate coupled to



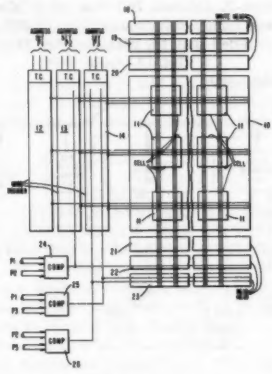
the control gate of said variable threshold transistor, the current through said shunt transistor being substantially less than that through said variable threshold transistor at the same potential on the control gates of said shunt transistor and said variable threshold transistor.

4,558,433

MULTI-PORT REGISTER IMPLEMENTATIONS

Kerry Bernstein, South Burlington, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 31, 1983, Ser. No. 499,728
Int. Cl.[4] G11C *7/00*
U.S. Cl. 365—189 **14 Claims**



1. In a memory array having cells each of which is separately addressable from a plurality of write lines and is readable by a plurality of sets of bit lines, comprising:

a memory cell array,

a plurality of write lines coupled to each cell in the array,

a plurality of sets of bit lines coupled to each cell in the array,

a low order and high order word decoders coupled to each cell of the array,

a low order and high order read heads coupled to each cell of the array via said plurality of bit lines, the number of said high order read heads being equal in number to the number of high order word decoders,

at least one multiplexer circuit coupled to each high order read head, and

an address comparison means coupled to each respective

one of said high order word decoders and to each respective one of said high order read heads,

said address comparison means comprising;

a compare module circuit coupled to a first exclusive OR circuit,

said compare module circuit comprising an exclusive-OR circuit coupled to a signal follower circuit,

each of said exclusive-OR circuits being further coupled to a respective set of input address lines.

4,558,434

SEMICONDUCTOR MEMORY DEVICE

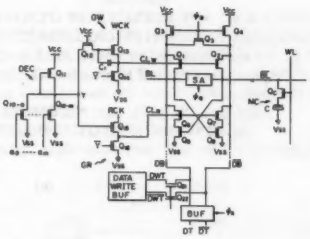
Fumio Baba; Hirohiko Mochizuki, and Hatsuo Miyahara, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jan. 25, 1984, Ser. No. 573,641

Claims priority, application Japan, Jan. 31, 1983, 58-12987

Int. Cl.[4] G11C *11/40*

U.S. Cl. 365—189 **6 Claims**



1. A semiconductor memory device, comprising:

a word line;

a pair of bit lines having potentials;

a memory cell operatively connected to said word line and one of said bit lines;

a pair of data buses;

first transfer means, operatively connected to said pair of bit lines and said pair of data buses, for transferring data from said pair of data buses to said pair of bit lines during a write operation; and

second transfer means, operatively connected to said pair of bit lines and said pair of data buses, for transferring data from said pair of bit lines to said pair of data buses during a read operation without substantially changing the potentials of said pair of bit lines.

4,558,435

MEMORY SYSTEM

Peter K. Hsieh, Parsippany, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed May 31, 1983, Ser. No. 499,397

Int. Cl.[4] G11C *11/40*

U.S. Cl. 365—203 **5 Claims**

1. A memory system comprising:

input means adapted to receive address signals having an output at which are produced signals of first binary significance when any address signal changes;

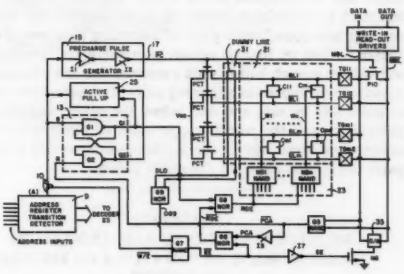
a memory array of cells including a pair of data bit lines and selectively enabled memory adressing means responsive, when enabled, to said address signals for selecting a cell and causing the read-out of its contents onto said data bit lines;

a normally disabled sense amplifier coupled to said data bit lines;

precharge means coupled to said input means responsive to a change in said address signals for precharging said data bit lines;

control means coupled to said input means responsive to said change in said address signals for temporarily inhibiting said selectively enabled memory addressing means; said control means including means responsive to said data bit lines being precharged to a predetermined level for terminating said precharging of said data bit lines and for then enabling said selectively enabled memory addressing means;

means including delay means responsive to the enabling of said selectively enabled memory address means for delaying the turn-on of said sense amplifier for a given time



delay to allow information read-out of a selected cell to be coupled onto said data bit lines, and for, after said given time delay, enabling said sense amplifier; said sense amplifier being of the type which, when enabled, functions as a latch causing said data bit lines to assume complementary binary conditions; and

means responsive to said complementary binary conditions on said data bit lines for then disabling said selectively enabled memory address means.

4,558,436

ARRANGEMENT OF A DYNAMIC RANDOM ACCESS MEMORY

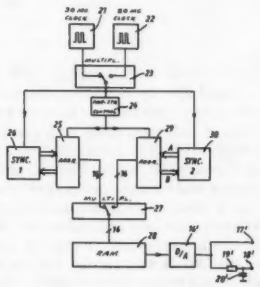
Eduard Wagensonner, Aschheim; Wolfgang Ruf, and Thomas Landsiedel, both of Munich, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed Sep. 27, 1982, Ser. No. 424,971

Claims priority, application Fed. Rep. of Germany, Oct. 22, 1981, 3141882

Int. Cl.[4] G11C *11/40*

U.S. Cl. 365—230 **5 Claims**



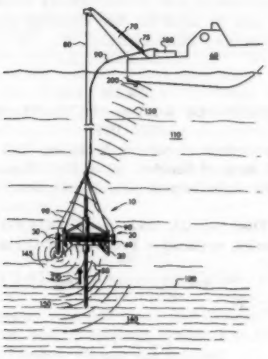
1. An arrangement of a high-capacity dynamic random access memory for use in a video circuit having a pick-up unit for scanning lines of picture elements according to interlaced scanning method, and a receiving unit having two interchangeable monitors of different resolutions, said arrangement comprising a plurality of RAM segments, the number of which is

determined by the number of gradations of picture elements; each segment including a plurality of consecutively arranged RAM chips the number of which is determined by a minimum read/write cycle time and by a scanning cycle time; each RAM chip including $n \times n \times 1$ memory locations arranged in address lines and address columns whereby the memory locations in each segment being simultaneously addressable; means for writing/reading binary signals pertaining to odd-numbered picture-element lines into one half of address columns of each RAM segment and means for writing/reading binary signals pertaining to even-numbered picture-element lines into another half of columns in the RAM segment; control means assigned to respective halves of each segment for writing/-reading into consecutive pairs of adjoining columns of storing locations sets of binary signals pertaining to corresponding video lines in each half in such a manner that the consecutively stored sets of signals in adjoining pairs of columns are arranged in pairs side by side and one below the other; and means for switching over the read-out operation to retrieve the stored information from one of the adjoining columns in respective pairs while jumping over the other column.

4,558,437
SEAFLOOR VELOCITY AND AMPLITUDE MEASUREMENT APPARATUS AND METHOD THEREFOR

Charles A. Meeder, Aurora; Anthony R. Tinkle, and Kenneth R. Wener, both of Littleton, all of Colo., assignors to Marathon Oil Company, Findlay, Ohio

Filed Apr. 5, 1982, Ser. No. 366,039
Int. Cl.⁴ G01V *1/16, 1/38*
U.S. Cl. 367—15 **5 Claims**



1. An improvement to an apparatus (10) operatively connected to a vessel (60) for measuring the velocity and amplitude of sound waves (150) from an acoustic pulse (145) passing through layers of sediments (140) with receivers (50) located below the mudline (130) of the seafloor (120), said apparatus (10) having a carrier (20), means (30) mounted to said carrier (20) for injecting said acoustic pulses (145) near said sediments (140), one or a plurality of interconnected vertically spaced sensors (50) embedded into said sediments (140), each of said sensors (50) being substantially vertically spaced below said injecting means (30) on said carrier (20) and being capable of sensing each of said sound waves (150) for generating an electrical signal representative of said sensed velocity and amplitude, said carrier (20) being capable of embedding said plurality of interconnected vertical sensors (50) into said sediments (140), and means (70, 75) on said vessel (60) connected to said carrier (20) for moving said embedded vertical sensors (50) upwardly through said sediments (140) at a given velocity, said improvement comprising:

said injecting means (30) being further capable of injecting said acoustic pulses at predetermined times (t_k),

said one or plurality sensors (50) being further capable of generating said electrical signal corresponding to each injected acoustic pulse at each said predetermined time (t_k),

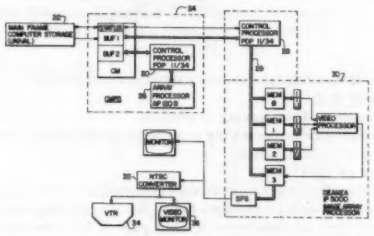
means (200, 100) located substantially vertical above said sensors (50) and sensing each of said sound waves (150) produced by each acoustic pulse at said predetermined times (t_k) for determining the distance (d_{ik}) that said one or plurality of sensors (50) have moved upwardly between successive acoustic pulses (145) while said moving means (70, 75) upwardly lifts said carrier (20), and

means (100) respective of said electrical signals from said one plurality of sensors (50) and receptive of said determined distance (d_{ik}) from said determining means (200, 100) for measuring the velocity and amplitude of each said pressure wave through said layers of sediment between said successive acoustic pulses.

4,558,438
METHOD AND APPARATUS FOR DYNAMICALLY DISPLAYING GEO-PHYSICAL INFORMATION

Richard C. Jones, Cheswick, and John M. Powell, Aspinwall, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Dec. 28, 1981, Ser. No. 335,205
Int. Cl.⁴ G01V *1/34;* **G11C** *8/00*
U.S. Cl. 367—71 **5 Claims**



2. A method of forming a sequence of images representing successive sections within a body at a particular time comprising

forming in a first memory a matrix store of bytes defining data points representing points contained in a series of planar regions within the body, each point having identifiable location characteristics and an intensity characteristic;

selectively extracting from the first memory a first set of bytes defining a set of data points representing locations lying in a first predetermined planar region in the body which can include points lying in more than one of the stored series of regions and storing the extracted bytes in a second memory;

selectively extracting from the first memory a second set of bytes defining a set of data points representing locations lying in a second planar region parallel with the first planar region and storing the second set of bytes in a third memory;

converting the bytes stored in the second memory into a signal form displayable on a CRT as a visually perceivable image representative of the first planar region;

recording the converted signals on a recording medium;

selectively extracting a first percentage of the values of bytes from the data points stored in the third memory and a second percentage of the value of the bytes from the data points stored in the second memory, said first percentage initially being smaller than said second percentage, the extracted bytes from the two memories representing loca-

tions in the two planar regions and the total of said first and second percentages equalling substantially 100%;

converting the selectively extracted bytes into a signal displayable on a CRT;

recording the converted signals on a recording medium; and

repeating the steps of extracting, converting the extracted bytes and recording the converted signals a predetermined number of times, each time increasing said first percentage of the value of the bytes extracted from the third memory and decreasing said second percentage of the value of the bytes extracted from the second memory until the second percentage extracted from the second memory is zero, thereby forming on the recording medium a sequence of signal sets displayable as a sequence of images, said sequence of images created by said repeated steps of extracting, converting and recording merging smoothly from the first planar region to the second planar region in the manner of a video dissolve when the recorded converted signals are displayed on a CRT to thereby create an illusion of motion through the body.

4,558,439

PASSIVE METHOD FOR OBTAINING TARGET DATA FROM A SOUND SOURCE

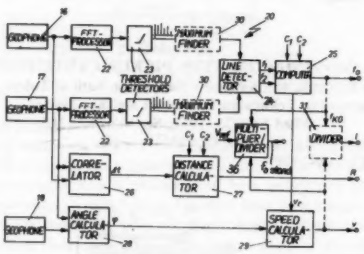
Alwin Güdesen, Morsum, Fed. Rep. of Germany, assignor to Fried. Krupp Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany

Filed Feb. 10, 1983, Ser. No. 465,638

Claims priority, application Fed. Rep. of Germany, Feb. 11, 1982, 3204874

Int. Cl.⁴ G01S *11/00, 5/18*

U.S. Cl. 367—127 **10 Claims**



1. A passive method for obtaining target data from a sound source moving along a predetermined path in a nonsolid medium, comprising:

disposing two sound-to-electrical signal transducers at a single, spatially defined, stationary measuring station which is remote from the sound source and which is in the vicinity of, and at a predetermined lateral spacing from, the predetermined path, and positioning the transducers to each respond to a respective one of two sound waves propagated from the sound source to the measuring station at respectively different propagation speeds;

producing representations of the frequency spectra of the sound waves arriving at the two transducers;

providing representations of the propagation speeds of the two sound waves;

determining, on the basis of the representations of the frequency spectra produced and the representations of the propagation speeds provided, the frequency spectrum of the sound waves emitted by the source and the component of the speed of the sound source in the direction of the station;

determining the speed of the sound source along the predetermined path;

standardizing the frequency spectrum representation on the basis of the speed of the sound source along the predetermined path; and

determining a characteristic of the sound source directly from the standardized frequency spectrum representation.

4,558,440

SYSTEM FOR RECORDING PATTERNS OF MAGNETICALLY RECORDED INFORMATION BY UTILIZING THE MAGNETO-OPTIC EFFECT

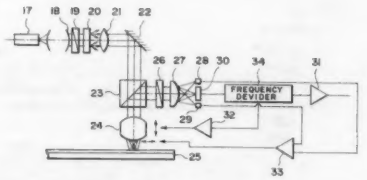
Yasuo Tomita, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 12, 1983, Ser. No. 522,719

Claims priority, application Japan, Aug. 19, 1982, 57-143836; Aug. 19, 1982, 57-143838

Int. Cl.⁴ G11B *5/32, 11/10*

U.S. Cl. 369—13 **13 Claims**



1. A system for reading patterns of magnetically recorded information by utilizing the magneto-optic effect, comprising:

first means for causing a light beam polarized in a predetermined direction to be incident on a magnetic recording medium, on which information is magnetically recorded, to be at least one of reflected by and transmitted through said magnetic recording medium;

second means for increasing a polarization component in a direction perpendicular to said predetermined direction, relative to the polarization component in said predetermined direction, of the light beam which is one of reflected by and transmitted through said recording medium, such that the polarization direction of the light beam which is one of reflected by and transmitted through said recording medium is rotated through a predetermined angle in accordance with said information, whereby said predetermined angle is larger than angle of rotation of the polarization direction of light which is one of reflected by and transmitted through said recording medium in the absence of said increasing by said second means; and

third means including a photodetector for producing a detection signal and having no multiplication function and an amplifier for amplifying the detection signal, said third means detecting the polarization direction of the light beam from said second means, producing the detection signal representative thereof, and reading the recorded pattern on said magnetic recording medium;

said second means being set so that S shown in the following equation becomes maximum:

$$S = 10\log_{10}\left\{ \frac{e^2\epsilon^2}{2h^2\nu^2} I_K^2 / \left(\frac{e^2\epsilon^2}{h^2\nu^2} \Delta I_R^2 + \frac{2e^2\epsilon}{h\nu} I_R + \frac{4kTe}{R_L} \right) \Delta B \right\}$$

where I_R is the intensity of the polarized component in said predetermined direction of the light beam from said second means, I_K is the intensity of the polarized component in the direction perpendicular thereto of said light beam, ΔI_R^2 is the mean square intensity fluctuation of I_R, e is the amount of charge, h is the Plank's constant, k is the Boltzmann's constant, ϵ is the quantum efficiency of said photodetector, R_L is the load resistance of said photode-

tector, Te is the equivalent noise temperature, ΔB is the band width of the detection signal, and ν is the frequency of the light beam.

4,558,441

DATA RECORDING AND REPRODUCING APPARATUS AND METHOD

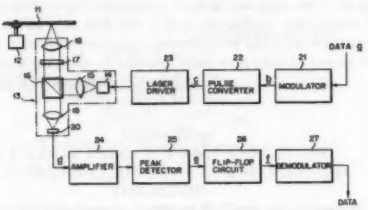
Tsuneshi Yokota, Kawasaki, and Akira Nakagawa, Yokohama, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 14, 1983, Ser. No. 474,979

Claims priority, application Japan, Mar. 15, 1982, 57-40606

Int. Cl.⁴ G11B *7/00*

U.S. Cl. 369—59 **13 Claims**



1. A data recording and reproducing apparatus comprising:

pulse converter means, connected to receive a pulse-width modulated data signal, for generating a write pulse signal including pulses which have a predetermined width and which are synchronous with the leading and trailing edges of the pulses of said pulse-width modulated data signal;

light beam radiating means, connected to receive said write pulse signal, for radiating a reproducing light beam toward a spinning optical disk, and for selectively radiating a recording light beam toward the optical disk in response to pulses of the write pulse signal to form pits on the disk;

photosensing means for receiving the portion of the reproducing light beam which is reflected by the optical disk and for converting said portion into a read signal, said read signal including peak components each corresponding to the light intensity of that portion of the repoducing light beam reflected from a pit on the disk;

peak detecting means connected to receive said read signal for generating a first series of output pulses, each of the first series of output pulses having an edge portion synchronous with a peak component of said read signal; and

reproducing means for generating a second series of output pulses, the widths of said second series of output pulses determined in proportion to the interval between the edge portions of succeeding pulses in said first series of output pulses, said second series of output pulses corresponding to said pulse-width modulated data signal.

4,558,442

DETECTOR CIRCUIT FOR CAPACITANCE DISC RECORDS

Kazuo Yamada, Noda, Japan, assignor to Victor Company of Japan, Limited, Yokohama, Japan

Filed Feb. 14, 1983, Ser. No. 466,391

Claims priority, application Japan, Feb. 15, 1982, 57-22392; Feb. 15, 1982, 57-22393

Int. Cl.⁴ G11B *9/06*

U.S. Cl. 369—126 **8 Claims**

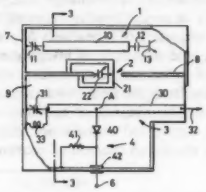
1. A capacitance detector adapted to be coupled to the electrode of a stylus for detecting information recorded in the form of a series of microscopic pits on a capacitance disc record, comprising within a housing which serves as an outer conductor:

a dielectric support;

an oscillator having a first line conductor on said support for generating microwave energy;

a coaxial resonator having a second line conductor on said support, said second line conductor being coupled to the stylus electrode;

means for inductively coupling the microwave energy from said oscillator to said coaxial resonator, the coupling means comprising a loop having a first section inductively coupled with said first line conductor and a second section inductively coupled with said second line conductor, and



a capacitor connected from an intermediate point of the loop between said first and second sections to ground, so that the microwave energy coupled to said second line conductor is modulated in amplitude with capacitance variations which occur in correspondence with said microscopic pits; and

an amplitude demodulator for demodulating said amplitude-modulated microwave energy to derive a signal representing the capacitance variations;

wherein said capacitor comprises a variable capacitance element.

4,558,443

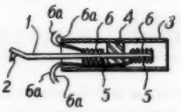
MOVING COIL TYPE PICKUP CARTRIDGE

Etsuo Koyama, and Kazuhiro Nakamura, both of Tokyo, Japan, assignors to Tekudaiya Kabushiki Kaisha, Japan

Filed Sep. 23, 1982, Ser. No. 422,215

Int. Cl.⁴ H04R *9/16*

U.S. Cl. 369—139 **5 Claims**



1. A pickup cartridge of the kind of including two moving coils for acoustic recording and reproducing comprising in combination;

a cartridge case having a longitudinally extending hole at its upper part,

a cantilever in the form of a rod including a stylus tip at its foremost end, said cantilever being inclinable within a limited extent in said longitudinally extending hole in the cartridge case,

a resilient holding means in the form of a damper rubber made of resilient material, said resilient holding means being firmly fitted into the longitudinally extending hole in the cartridge case in such a manner that it serves as a fulcrum for vibratory inclination of the cantilever so as to inclinably hold the latter,

a pair of coils wound about the cantilever, said coils being located opposite to one another relative to the resilient holding means disposed therebetween,

a pair of yokes including a permanent magnet disposed between their lower parts so as to generate two magnetic fields which are directed at a right angle relative to one another at their upper part, one of the magnetic fields being located corresponding to one of the coils and the

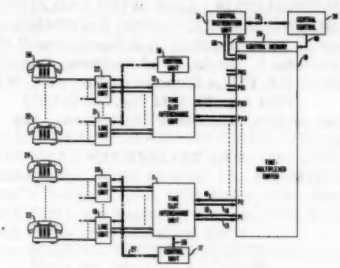
other one being located corresponding to the other coil, said yokes and said magnet being fixedly held in the cartridge case by embedding or the like process, and

terminal means disposed at the rear part of the cartridge case, said terminal means being in electrical connection with the coils on the cantilever via the lead wires so as to deliver output from the coils to an amplifier in a record player or the like.

4,558,444
SWITCHING SYSTEM HAVING SELECTIVELY INTERCONNECTED REMOTE SWITCHING MODULES

James C. Kennedy, St. Charles; Lawrence J. Trimnell, Wheaton, and Meyer J. Zola, Oak Park, all of Ill., assignors to AT&T Laboratories, Murray Hill, N.J.

Filed May 11, 1983, Ser. No. 493,682
Int. Cl.[4] H04Q *11/04*; H04J *3/12*
U.S. Cl. 370—58 **6 Claims**



1 An arrangement comprising:

a host switching system comprising a plurality of first host time stages, a host space stage, a plurality of second host time stages and a plurality of host peripheral circuits connected to said first and second host time stages,

a remote switching system comprising a plurality of first remote time stages, a remote space stage, a plurality of second remote time stages and a plurality of remote peripheral circuits connected to said first and second remote time stages,

interconnection means for interconnecting said remote space stage to a given one of said first host time stages and for interconnecting a given one of said second host time stages to said remote space stage,

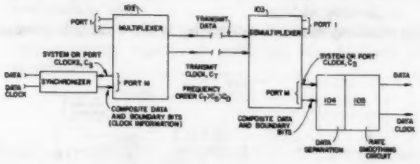
wherein said remote switching system further comprises remote control means for controlling said first and second remote time stages and said remote space stage to provide communication paths from said remote peripheral circuits via said first remote time stages and said remote space stage to said interconnection means and to provide communication paths from said interconnection means via said remote space stage and aaid second remote time stages to said remote peripheral circuits and

wherein said host switching system further comprises host control means for controlling said first and second host time stages and said host space stage to provide communication paths from said host peripheral circuits via said first host time stages, said host space stage, and said given second host time stage to said interconnection means and to provide communication paths from said interconnection means via said given first host time stage, said host space stage and said second host time stages to said host peripheral circuits.

4,558,445
APPLIQUE RATE CONVERTER

Leonard R. Novick, Acton, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 18, 1984, Ser. No. 601,520
Int. Cl.[4] H04J *3/07*
U.S. Cl. 370—84 **6 Claims**



1. In combination with a first and second digital data system, a multiplexer and demultiplexer, a rate converting system permitting said multiplexer and said demultiplexer to support said first and second digital data systems, said first and second digital data systems having less than one half the data rate of said multiplexer, said rate converting system comprising:

a data selection means receiving a digital data signal and a data clock signal from said first digital data system, said data clock signal indicating the data rate of said first digital data system, said data selection means producing a data bit signal;

a boundary selection means receiving a system clock signal from said multiplexer, said system clock signal indicating the input data rate of said multiplexer, said boundary selection means producing a data boundary bit signal;

an interface select chip receiving said data bit signal from said data selection means and alternating it with said data boundary bit signal from said boundary selection means to produce and send a composite data and clock signal to said multiplexer, said composite data and clock signal having the input port data rate of said multiplexer, said interface select chip sending said composite data and clock signal to said multiplexer for transmittal to said demultiplexer;

a data separator means receiving said composite data and clock signal from said demultiplexer, said data separator means separating said composite data and clock signal into said digital data signal and said data clock signal; and

a rate smoothing means receiving and smoothing said digital data signal and said data clock signal from said data separator means, said rate smoothing means sending said digital data signal and said data clock signal to said second digital data system.

4,558,446
MEMORY SYSTEM

Fumiyasu Banba, Hadano, and Mikito Ogata, Odawara, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 4, 1983, Ser. No. 491,590
Claims priority, application Japan, May 7, 1982, 75213
Int. Cl.[4] G11B *5/09*; G06F *11/00*
U.S. Cl. 371—10 **4 Claims**

1. A memory system having an information recording area for storing information and an alternative area for storing information replacing information stored as defective information in a defective location in said information recording area and the address of the defective location, said system comprising:

(a) first reading-out means for reading out all of the information recorded on said alternative area;

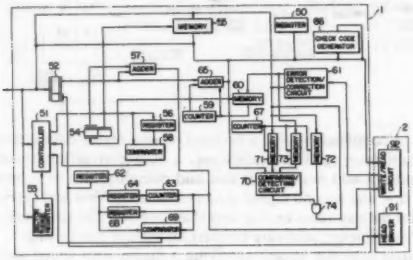
(b) memory means for storing information and including a memory capable of being read out at a higher speed than the speed at which said first reading-out means reads out the information recorded on said alternative area;

(c) address information storing means for storing addresses at which said defective information is stored in said information recording area;

(d) writing means for writing in said memory means information read out from said alternative area by said first reading-out means;

(e) second reading-out means for reading out data from said information recording area in response to a reading-out requesting address;

(f) checking means for checking to see if there is present in



said address information storing means an address which coincides with a reading-out requesting address for said information recording area;

(g) third reading-out means for reading out from said memory means information designated by the address which is determined to coincide with said reading-out requesting address by said checking means; and

(h) means for controlling the writing operation of said writing means so that said writing operation is carried out prior to the reading operation for said information recording area.

4,558,447

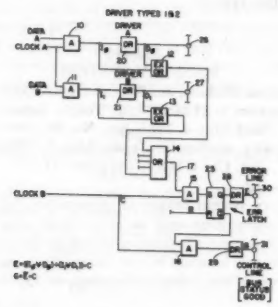
SELF-TESTING FACILITIES OF OFF-CHIP DRIVERS FOR PROCESSOR AND THE LIKE

Joseph W. Freeman; Wayne R. Kraft, both of Coral Springs; Hobart L. Kurtz, Boca Raton, and Israel B. Magrisso, Coral Springs, all of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 28, 1983, Ser. No. 470,033

Int. Cl.⁴ G06F *11/00*

U.S. Cl. 371—71 **9 Claims**



3. A self-testing system for driver circuits in a data processing system and the like, said system comprising:

a plurality of circuit chips accomodating processor, storage, input/output circuitry, and the like;

a plurality of driver circuits associated with each of said circuit chips for developing signals for use externally of said circuit chips;

interconnection means for interconnecting said circuit chips for communication of said circuit chips with one another or with other devices; and

test logic connected in said system to said driver circuits for monitoring signal conditions, said test logic comprising a comparison circuit connected to each driver circuit, said comparison circuit monitoring the input signal to the associated driver circuit and the output signal from said driver circuit, said comparison circuit further providing an error signal in the event of a disparity between said input and output signals of said associated driver circuit, common error detection circuitry connected to the output of all of said individual comparison circuits and operable to sense an error signal from any comparison circuit, and latch means incorporated in said detection circuitry for storing any such error indication, said latch means providing an error indication to inform said system of any failure of said driver circuits.

4,558,448

SEMICONDUCTOR LASER WITH END ZONES FOR REDUCING NON-RADIATING RECOMBINATION

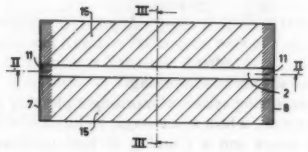
Johannes A. dePoorter; Peter J. deWaard; Rudolf P. Tijburg, and Gerardus L. Dinghs, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 27, 1982, Ser. No. 412,052

Claims priority, application Netherlands, Sep. 2, 1981, 8104068

Int. Cl.⁴ H01S *3/19*

U.S. Cl. 372—44 **6 Claims**



1. A semiconductor laser having a semiconductor body comprising an active laser region having a p-n junction, in which said active region is present within a resonator which is formed by two mutually parallel reflecting non-oxidized, non-metallic mirror faces, said mirror faces being formed by crystal cleavage surfaces, in which contact members are present to supply current in the forward direction to said p-n junction to generate coherent electromagnetic radiation in said active region, and in which said active region comprises end zones adjoining said mirror faces to reduce non-radiating recombination adjacent said mirror faces, characterized in that said end zones are formed by parts of said active region which comprise implanted ions with associated crystal damage and extend from said mirror faces a distance which is approximately equal to the diffusion length of recombining charge carriers in said end zones.

4,558,449

SEMICONDUCTOR LASER WITH COUPLED LOSS MODULATOR FOR OPTICAL TELECOMMUNICATIONS

Eugene I. Gordon, Convent Station, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

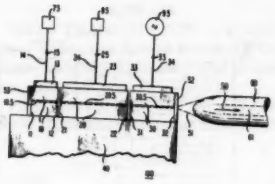
Filed Jul. 8, 1983, Ser. No. 511,847

Int. Cl.⁴ H01S *3/19*

U.S. Cl. 372—44 **25 Claims**

1. A semiconductor laser source comprising

(a) a first semiconductor heterojunction section for generating single-mode CW optical radiation;
(b) a second semiconductor heterojunction section, the first and second sections having substantially identical heterojunction cross sections which are mutually optically coupled and closely spaced from each other at the closest approach of an end facet, respectively, of each of the first and second sections;



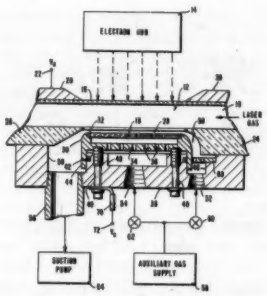
(c) means for applying a variable voltage to the second section in order to modulate optical loss in said second section; and
(d) an optical anti-reflection layer optically coupled to another, opposite end facet of the second section, whereby the optical radiation generated in the first section is modulated by the second section and passes through the anti-reflection layer.

4,558,450

CATHODE BLEED ARRANGEMENT FOR ELECTRICALLY EXCITED FLOWING GAS LASERS

George Wakalopulos, 16832 Charmel La., Pacific Palisades, Calif. 90272; Robert A. Hill, 6979 Trolley Way, Playa Del Rey, Calif. 90291, and Eugene R. Peressini, 5021 Browndeer La., Palos Verdes Peninsula, Calif. 90274

Continuation of Ser. No. 62,858, Jul. 31, 1979. This application Mar. 29, 1982, Ser. No. 363,317
Int. Cl.⁴ H01S *3/097*
U.S. Cl. 372—87 **14 Claims**



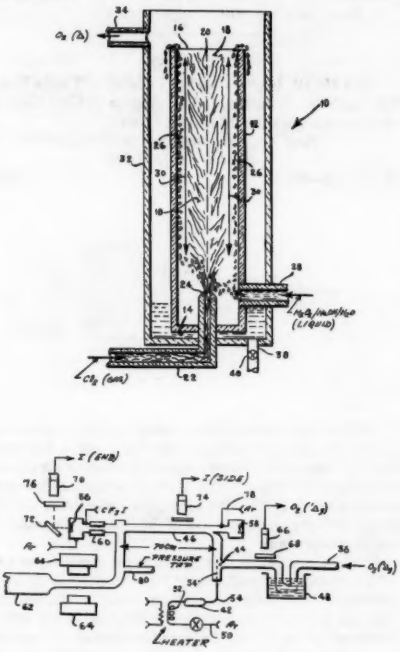
1. In an electrically excited laser wherein a working gas capable of being excited to a condition of population inversion is caused to flow through an excitation region from an upstream end to a downstream end, an electric discharge is established along a direction transverse to the direction of flow of said working gas between an anode and a cathode disposed on opposite sides of said excitation region, and an electron beam is introduced into said excitation region along a direction parallel to the direction of said discharge, the improvement comprising:
said cathode including a porous member of electrically conductive material having a surface facing said anode;
means for introducing first and second quantities of an auxiliary gas having a normal glow current density substantially different from that of said working gas into different portions of said excitation region, said first quantity being introduced into said upstream end at a location adjacent to said surface of said porous member and being directed into a flow path across said surface along a direction parallel to the flow direction of said working gas;
said second quantity being introduced into said flow path through said porous member such that it is gradually added to said first quantity of auxiliary gas flowing across said surface; and
means coupled to said flow path at said downstream end of said excitation region for removing said auxiliary gas therefrom.

4,558,451

TUBULAR SINGLET DELTA OXYGEN GENERATOR

William E. McDermott, Albuquerque; David E. Ellis, Kirtland AFB; Nicholas R. Pchelkin, Los Lunas; George W. Miller, Rio Rancho, all of N. Mex.; David J. Benard, Newbury Park, and Ralph J. Richardson, San Ramon, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 19, 1982, Ser. No. 399,567
Int. Cl.⁴ H01S *3/095;* **C01B** *13/00*
U.S. Cl. 372—89 **3 Claims**



3. A laser system comprising:
(A) a laser, said laser having a lasing cavity and means for creating a vacuum; and
(B) a singlet delta molecular gas generator interconnected to said laser and comprising;
(1) a vacuum chamber;
(2) an elongated tubular reaction chamber positioned within said vacuum chamber, said reaction chamber having sidewalls running parallel to the longitudinal axis of said reaction chamber and which define a substantially circular cross-sectional interior portion, said

reaction chamber further having a closed end and an oppositely disposed open end;

(3) means for introducing and directing a flow of a gaseous reactant into said reaction chamber, said means for introducing said gaseous reactant being positioned within the closed end of said reaction chamber wherein said gaseous reactant flows substantially parallel to the longitudinal axis of said reaction chamber and assumes a substantially circular cross-sectional area as defined by said walls;

(4) means for introducing and directing an aspirated stream of a liquid reactant into said reaction chamber adjacent to the flow of said gaseous reactant, said means for introducing a liquid reactant being positioned within the sidewalls of said reaction chamber at an angle prependicular to the longitudinal axis of said reaction chamber thus providing a gas/liquid interface of circular cross-section along the interior surface of said sidewalls of said elongated reaction chamber to affect reaction between said gaseous and liquid reactants and thereby generate a singlet delta, electronically excited, molecular oxygen gas; and

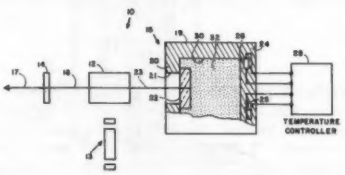
(5) means interconnected between said vacuum chamber and said lasing cavity for drawing and directing a flow of said generated electronically excited molecular oxygen gas from said generator to said cavity for subsequent reaction with a lasing medium.

4,558,452

NARROW BANDWIDTH LASER APPARATUS

Steve Guch, Jr., Saratoga, Calif., assignor to GTE Government Systems Corporation, Stamford, Conn.

Filed Aug. 20, 1984, Ser. No. 642,319
Int. Cl.⁴ H01S *3/08*
U.S. Cl. 372—99 **4 Claims**



1. In laser apparatus having a lasing medium, means to pump said medium for producing a laser beam, and a first partially optically transmissive output reflective element on one side of the medium defining one end of the laser cavity, the improvement of a second reflective element on the other side of the medium defining the other end of the laser cavity, said second element comprising:

a cell having a window and containing a metal vapor capable of exhibiting substantial laser beam reflection as a consequence of anomalous dispersion which produces narrow spectral regions in which the refractive index difference between the vapor and cell window becomes large enough to produce spectrally-localized high reflectivity at normal incidence.

4,558,453

SYNCHRONIZATION METHOD AND FREQUENCY HOPPING COMMUNICATION SYSTEM

Frederick Mimken, Rochester, N.Y., assignor to Harris Corporation, Melbourne, Fla.

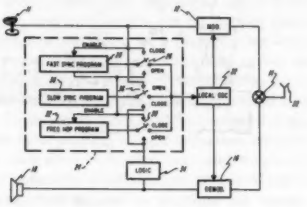
Continuation of Ser. No. 331,222, Dec. 16, 1981, abandoned.
This application Dec. 22, 1983, Ser. No. 564,313
Int. Cl.⁴ H04B *15/00*
U.S. Cl. 375—1 **26 Claims**

21. A method of synchronizing a receiver to a transmitter for frequency hopping radio communications comprising the steps of:

(a) tuning the receiver the receive signals at M successive discrete frequencies at a rate N;

(b) detecting a predetermined sync acquisition signal;

(c) tuning the receiver to receive signals at P successive discrete frequencies at a rate Q responsively to the detection of the sync acquisition signal, P being at least twice M



and Q being at least twice N, to thereby initially synchronize the receiver for frequency hopping communications with a remote transmitter;

(d) detecting a sync maintenance signal; and

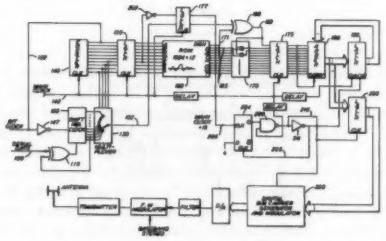
(e) adjusting the time of shifting of the P discrete frequencies responsively to the detection of the sync maintenance signal to thereby maintain synchronization between the receiver and the remote transmitter.

4,558,454

DIGITAL PARTIAL RESPONSE FILTER

Michael T. Hills, Silver Spring, Md., and Raymond L. Heinrich, Great Falls, Va., assignors to National Information Utilities Corporation, McLean, Va.

Filed Apr. 11, 1983, Ser. No. 483,738
Int. Cl.⁴ H04L *25/34, 25/49*
U.S. Cl. 375—18 **11 Claims**



1. A digital partial response filter for forming a digital representation of the partial response channel response to input digital data, said input digital data having a data symbol period, comprising:

means for storing digitized samples of a substantially partial response channel response to a representative input data symbol for n data symbol time periods, each data symbol time period divided into m samples, where n and m are finite numbers and for providing as outputs, in succession, m groups of n digitized samples, said n digitized samples provided as samples of said partial response channel response at n equally divided data symbol time periods, each successive group having the digitized samples shifted by one sample in said data symbol time period;

summing means responsive to said input digital data for successively summing the digitized samples of each of said m groups of n digitized samples so as to form said digital

representation of the partial response channel response to said input digital data for a data symbol period; and

means for providing said input digital data to said summing means shifted by one data symbol every m groups, whereby to allow said summing means to form the digital representation of the partial response channel response to said input digital data for successive data symbol periods.

4,558,455

DATA TRANSMISSION SYSTEM

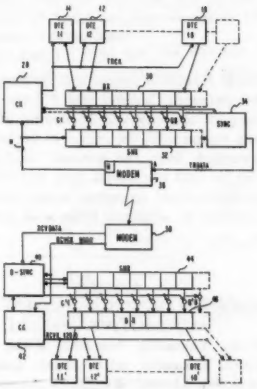
Gabriel Epenoy, Vence, and Roland Kuhne, La Colle sur Loup, both of France, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 23, 1983, Ser. No. 535,128

Claims priority, application European Pat. Off., Sep. 28, 1982, 82430029.7

Int. Cl.⁴ H04J *3/06*

U.S. Cl. 375—112 **6 Claims**



1. A data transmission system comprising a transmit section and a receive section for exchanging pure data information between a transmitting set and a receiving set of data terminals through modem units provided with internal clock means, said system including:

at the transmitting site:

a transmission buffer register each individual bit position of which is connected to a respective terminal of said transmitting set of data terminals;

transmit clock means responsive to the modem internal transmission clock for providing an external transmission clock signal controlling the loading of said transmission buffer register by said pure data information provided by said transmitting terminals;

a transmission shift register connected to said transmission buffer register;

means for unloading the contents of said transmission buffer register into said transmission shift register;

transmission formatting means connected to said transmission shift register and to said transmit clock means;

means for serializing said transmission shift register contents bit shifting it into said transmission formatting means wherein said contents is formatted into a synchronous bit train and provided to said modem for being transmitted;

means for examining the contents of said transmission shift register at the time it is loaded to detect the presence of a unique character, not normally found in data, and formed therein as a result of the combination of bits supplied by the respective terminals and for inhibiting the operation of said transmission formatting means and for resetting the same to an initial state; and,

at the receiving site:

receive clock means connected to the receiving modem;

a reformatting logic circuit connected to said receiving modem and to said receive clock means for converting the data provided by the receiving modem into a pure data bit train and for assuming a first state upon the receipt of a said unique character and a second state a predetermined time period thereafter;

a receive deserializer connected to said reformatting logic circuit for deserializing said pure data bit train;

a receive buffer register connected to said receive deserializer;

means for unloading said receive deserializer contents into said receive buffer register;

means for examining the contents of said receive deserializer immediately prior to unloading its contents into the receive buffer register to detect the presence of a said unique character and for inhibiting the unloading of the contents of the receive deserializer into the receive buffer when the said reformatting logic is in the said second state; and,

means connected to said receive clock means to control the transfer of said receive register contents into said receiving set of terminals.

4,558,456

APPARATUS FOR MONITORING THE LEVEL OF LIQUID IN A TANK OR RESERVOIR

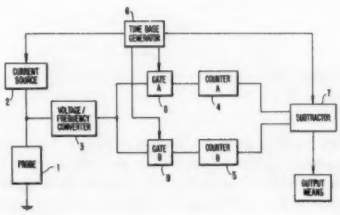
Jean-Jacques Bezard, La Garenne; Charles H. Jourdain, Frepillon, and Bruno Lalanne, Courbevoie, all of France, assignors to JAEGER, France

Filed Sep. 27, 1982, Ser. No. 424,447

Claims priority, application France, Oct. 7, 1981, 81 18852

Int. Cl.⁴ G01F *23/24*

U.S. Cl. 377—25 **5 Claims**



1. An apparatus for monitoring the level of liquid in a tank or reservoir, of the type comprising a probe formed by a resistive metal element having a high temperature coefficient, a means for supplying current to the probe, and means for comparing the initial voltage Uo measured at the terminals of the probe at the time at which the current supply means is set in operation, to the voltage Ut measured at the terminals of the said probe at the time when there is a condition of thermal stability, characterised in that said comparison means comprise:

a voltage-frequency converter having its input connected to the terminals of the probe,

two counters connected in parallel to the output of the voltage-frequency converter,

a time base controlling a first of said counters to count for a given period of time, from the moment at which the current supply means is set in operation, the content of the first counter at the end of the counting operation thus representing the voltage Uo, and controlling the second counter to count for the same given period of time when the probe has attained its condition of thermal stability, the content of the second counter at the end of the counting period thus representing the voltage Ut, and,

a subtracting means which is connected to the output of the two counters and which is controlled by the time base for

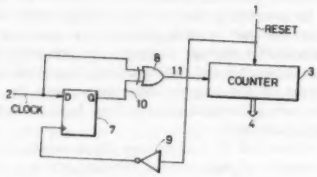
producing an output signal that is proportional to the difference between the contents of the two counters.

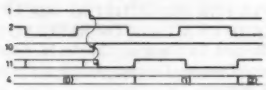
4,558,457

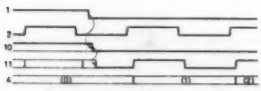
COUNTER CIRCUIT HAVING IMPROVED OUTPUT RESPONSE

Toshio Tabata, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Nov. 1, 1983, Ser. No. 547,615
Claims priority, application Japan, Nov. 1, 1982, 57-192888
Int. Cl.[4] H03K *21/32*
U.S. Cl. 377—107 **3 Claims**







1. An improved counter circuit in which a counter can begin its counting operation following the release of a reset signal within one half of the period of an input clock signal, comprising, an exclusive-OR gate coupled directly to an input clock signal, a counter, coupled to an output of said exclusive-OR gate, a flip-flop circuit having an input reset signal coupled to the counter through said flip-flop circuit, wherein said input clock signal is also inputted into said flip-flop circuit, and wherein an output signal from said flip-flop circuit is supplied as a gate signal for said exclusive-OR gate.

4,558,458

POSITIONING UNIT FOR RADIATION TOMOGRAPHY APPARATUS

Kenichiro Katsumata, Otawara, and Yasuo Nobuta, Tochigi, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 513,786, Jul. 15, 1983, which is a continuation of Ser. No. 331,024, Dec. 15, 1981, abandoned. This application Dec. 8, 1983, Ser. No. 559,011
Claims priority, application Japan, Dec. 17, 1980, 55-178399
Int. Cl.[4] G03B *41/16*
U.S. Cl. 378—20 **4 Claims**

1. A positioning unit for a radiation tomography apparatus comprising:

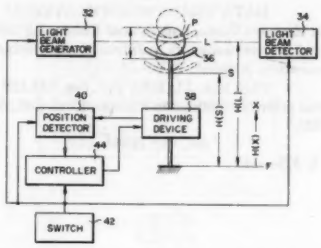
light beam detection means and a light beam generator which are disposed opposite to each other on a horizontal line passing through the center of a photographing region irradiated by X-rays;

a table top on which an object is laid;

driving means for lifting and lowering said table top;

position detection means for outputting a signal whose magnitude corresponds to a positon of said table top; and

controller which obtains distance data corresponding to a distance from an upper surface of a part of body to be photographed of the object to said horizontal line of said photographing region, based on an output signal of said



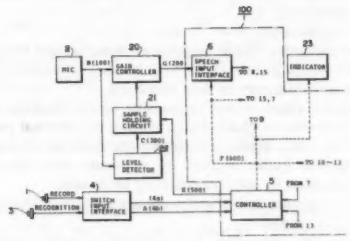
light beam detection means and an output signal of said position detection means, which obtains distance data necessary for aligning said horizontal line of said photographing region with the center of the part of body to be photographed, from the distance data and data corresponding to said horizontal line, and which drives said driving means until an output which corresponds to the distance data is obtained from said position detection means.

4,558,459

SPEECH RECOGNITION SYSTEM FOR AN AUTOMOTIVE VEHICLE

Kazunori Noso, Yokosuka; Norimasa Kishi, Yokohama, and Toru Futami, Yokosuka, all of Japan, assignors to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Jan. 6, 1983, Ser. No. 456,323
Claims priority, application Japan, May 1, 1982, 57-72592
Int. Cl.[4] G10L *1/00*
U.S. Cl. 381—43 **6 Claims**



1. A speech recognition system for an automotive vehicle which can activate an actuator in response to a spoken instruction inputted through a microphone which comprises:

(a) a recognition switch for outputting a recognition switch signal when closed;

(b) a controller for outputting a first command signal in response to the recognition switch signal and a second command signal a predetermined time period after the first command signal has been outputted therefrom;

(c) means for controlling the gain at which a spoken instruction signal transduced through the microphone is amplified, said gain controlling means detecting the background noise signal transduced through the microphone in response to the first command signal from said controller,

averaging the detected background noise signal, and adjustably fixing the gain at an appropriate level on the basis of the averaged background noise level obtained when the second command signal is outputted from said controller thereto, in such a way that the gain is inversely proportional to the averaged background noise level; and

(d) a speech recognizer for amplifying a spoken instruction signal inputted through the microphone after said controller outputs the second command signal to said gain controlling means on the basis of the gain adjustably fixed by said gain controlling means and for activating the actuator when the spoken instruction signal amplified on the gain adjustably fixed by said gain controlling means is determined to be resemble to that previously recorded in the system.

4,558,460

AUDIO APPARATUS FOR VEHICLE

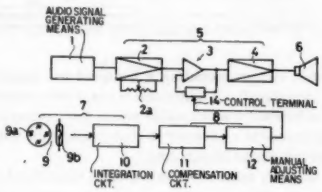
Shuji Tanaka, Saitama; Shigehira Nakamura, Tokyo; Tuneaki Sakamoto, Shiki; Yoshiaki Hirakata, and Tetsuo Yamagata, both of Tokyo, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 12, 1984, Ser. No. 619,968

Claims priority, application Japan, Jun. 14, 1983, 58-104892

Int. Cl.⁴ H03G *3/32*

U.S. Cl. 381—86 **11 Claims**



1. An audio apparatus for a vehicle, comprising:

means for generating an audio signal;

amplifying means operatively connected to said generating means for amplifying an audio signal received from said generating means;

sound emitting means for emitting sounds and which is driven by said amplifying means;

means for detecting vehicle speed; and

gain control means operatively connected to said speed detecting means for generating a control signal and providing it to said amplifying means, such that said control signal increases the gain of the amplifying means according to an increase in the output of said speed detecting means, wherein the output of said amplifying means, or the sound volume, is kept constant if the vehicle speed is below speed V_1 where V_1 is a predetermined, extremely low speed, and the output of said amplifying means is increased as the vehicle speed is increased above V_1, and wherein said output of said amplifying means increases at a faster rate when the vehicle speed is above V_2 than when it is below V_2 where V_2 is a predetermined vehicle speed faster than V_1 and above which the wind noise greatly increases.

4,558,461

TEXT LINE BOUNDING SYSTEM

Arthur Schlang, Coram, N.Y., assignor to Litton Systems, Inc., College Park, Md.

Filed Jun. 17, 1983, Ser. No. 505,545

Int. Cl.⁴ G06K *9/36*

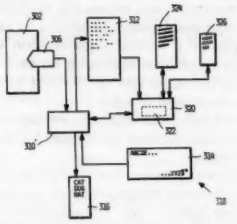
U.S. Cl. 382—9 **12 Claims**

1. In an optical scanning system having an optical scanning head for sequentially scanning horizontally across a document to create pixel oriented data representing text of the document for subsequent comparison searching to determine the alphanumeric contents of the document, the improvement for automatically compensating for text line skew comprising:

(a) means for dividing the data into equal swaths representing vertical columns on the documents;

(b) means for scanning the data by swath to determine the apparent text line initiations and termination contained therein and for creating a data matrix of initiation/termination pairs by swath; said data matrix having at least left and right boundaries;

(c) means for sequentially searching the data in the data



matrix left and right for each pair in a base vector swath, representative of a predetermined range of apparent text line initiations and terminations, to trace the data indicative of apparent text lines to determine a plurality of points apparently on base lines of respective ones of the apparent text lines of the document;

(d) means for determining the apparent skew angle of the text from the points on the apparent base lines; and;

(e) means for bounding the data of the apparent text lines for subsequent comparison searching from the found intersection/termination pairs and apparent skew angle determined.

4,558,462

APPARATUS FOR CORRECTING IMAGE DISTORTIONS AUTOMATICALLY BY INTER-IMAGE PROCESSING

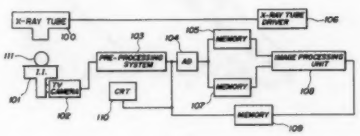
Isao Horiba, Kariya, and Akira Iwata, Nagoya, both of Japan, assignors to Hitachi Medical Corporation, Japan

Filed Aug. 31, 1983, Ser. No. 528,249

Claims priority, application Japan, Sep. 2, 1982, 57-151802

Int. Cl.⁴ G06K *9/36*

U.S. Cl. 382—42 **9 Claims**



1. An apparatus for correcting image distortions automatically by inter-image processing, comprising:

a first memory for storing a first image;

a second memory for storing a second image;

a first processing means for segmenting the image stored in said first memory to first segmental images of a predetermined size where each of said first segmental images has a central region and peripheral regions surrounding the central region;

a first multiplication means for multiplying each of said first segmental images by a first segmentation window function, said function emphasizing the central region and de-emphasizing the peripheral region of each semental image and thus lessen the adverse effects fue to discontinuities in the peripheral region;

a second processing means for performing a Fourier transform for each multiplication performed by said first multiplication means;

a third processing means for performing a spatial filtration for each Fourier transform performed by said second processing means, said spatial filtration for lessening the effect of the segmentation window function;

a fourth processing means for segmenting the image stored in said second memory to second segmental images of a size same as that of said segmental images produced by said first processing means where each of said second segmental images has a central region and a peripheral region surrounding the central region;

a second multiplication means for multiplying each of said second segmental images produced by said fourth processing means by a second segmentation window function, said second function operating on said second segmental images in the same way as the first function operates on the first segmental images;

a fifth processing means for performing a Fourier transform for each multiplication performed by the second multiplication means;

a sixth processing means for performing a spatial filtration for each Fourier transformation performed by the fifth processing means, said last-mentioned spatial filtration lessening the effect of said second segmentation window function;

a seventh processing means for performing a cross correlation computation, on a complex plane, between mutually corresponding outputs of said third and sixth processing means;

an eighth processing means for performing an inverse Fourier transform for each cross correlation computation performed by said seventh processing means; and

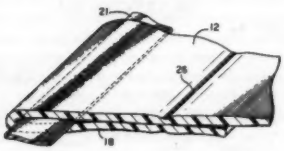
a ninth processing means for computing an amount of mutual displacement between the first and second segmental images based on said cross correlation computations.

4,558,463

HEM SEAL FOR DRAW TAPE TRASH BAG

Dana M. Boyd, Rushville, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jul. 31, 1984, Ser. No. 636,294
Int. Cl.⁴ B65D *33/28*
U.S. Cl. 383—75 **8 Claims**



1. A draw tape bag for carrying trash and the like comprising:

two panels formed from a tube of extruded polyethylene which is oriented in the extruded direction, the sides of said panels being heat sealed and cut from said tube in a perpendicular direction, said tube being slit to form an open top in said bag for reception of trash and the like;

a hem portion of each panel being folded over adjacent said top;

draw tapes in each hem secured at said sides of said panels; and

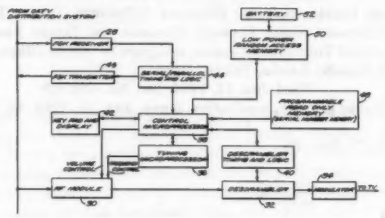
a tack seal between each hem portion and the adjacent panel, said tack seal extending in said extruded direction across the width of said bag below said draw tape, said tack seal including a continuous line of heat fused polyethylene between said hem portion and said adjacent panel including a single groove formed solely by application of moderate heat with negligible re-orientation of said polyethylene in said perpendicular direction on both sides of said groove, the depth of said groove being less than ½ the thickness of said panel.

4,558,464

ADDRESS-PROGRAMMABLE CATV CONVERTER

Thomas E. O'Brien, Jr., Warminster, Pa., assignor to General Instrument Corporation, New York, N.Y.

Continuation of Ser. No. 502,934, Jun. 10, 1983, abandoned.
This application Jul. 22, 1985, Ser. No. 757,762
Int. Cl.⁴ H04H *1/02;* **H04N** *1/00, 7/167*
U.S. Cl. 455—4 **10 Claims**



1. In a video system including a headend for supplying a scrambled video signal and addressed control information to a plurality of individually addressable subscriber converters, an address-programmable converter in communication with said headend, said converter comprising:

read only memory means for permanently retaining a predetermined identification code uniquely identifying said converter,

means for sequentially receiving first and second data sets transmitted from said headend,

said first data set including at least a converter identification code and corresponding thereto a logical address code preassigned at the headend, said logical address code being unique to the converter within said system,

programmable memory means for storing information transferred thereto,

processing means connected to said receiving means, read only memory means and programmable memory means,

said processing means including means for operatively comparing said predetermined identification code stored in said read only memory means with said received converter identification code included in said first data set and upon detection of a predetermined relationship between said received and stored identification codes, storing in said programmable memory means said received unique logical address code included in said first data set,

said second data set being transmitted from the headend subsequent to the transmission of said first data set, said second data set including at least a converter control code and an address code,

said processing means further comprising means for operatively comparing said stored logical address code provided by way of said first data set with said received address code included in said second data set and upon a valid match therebetween, storing in said programmable memory means said control code,

the system thereby supplying uniquely addressed control information to a preselected converter on the basis of a unique and programmable logical address provided to the converter from the headend.

4,558,465

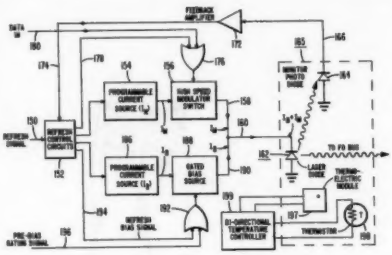
SWITCHED BIAS SCHEME FOR HIGH SPEED LASER TRANSMITTER

Stefan A. Siegel, East Windsor Township, Middlesex County, N.J.; David R. Patterson, Lower Makefield Township, Bucks County, Pa.; Donald J. Channin, Lawrence Township, Mercer County; Joseph B. Sergi, Jr., Cherry Hill Township, Camden County, both of N.J., and Jeffrey P. Viola, Brookhaven Borough, Pa., assignors to RCA Corporation, Princeton, N.J.

Filed Sep. 19, 1983, Ser. No. 533,774

Int. Cl.[4] H04B *9/00*

U.S. Cl. 455—609 **5 Claims**



1. In a system for receiving and transmitting light encoded data bursts on a fiber optic data bus, a method for switching to an on condition a light emitting diode having an operating characteristic curve with a low rate of increase of emitted light intensity over a first portion thereof extending from zero excitation level to a first excitation level induced by a bias current I_B and a high rate of increase of emitted light intensity with additional increasing excitation over a second portion thereof extending from the first excitation level to a second excitation level induced by a sum current I_B+I_M equal to the sum of said bias current I_B and a modulating current I_M and comprising the steps of:

progessively exciting said diode from a substantially zero excitation level to said first excitation level induced by I_B;

progressively exciting said diode from said first excitation level to said second excitation level resulting from an excitation current gradually increasing from I_B to I_B+I_M;

reproducibly storing I_B and I_M;

generating a series to two level electrical data burst signals;

supplying I_B to said diode immediately preceding and during the generation of said series of two level electrical data burst signals;

terminating the supply of I_B to said diode at the end of the generation of each two level electrical data burst signal to return the excitation of said laser diode to zero; and

supplying I_M to said diode in response to the high level portions of said electrical two-level data burst signals while supplying I_B to said diode.

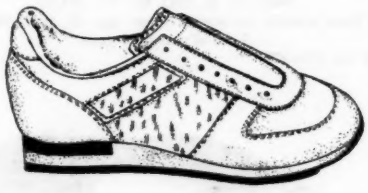
DECEMBER 10, 1985

281,636
PAIR OF TROUSERS WITH REMOVABLE POCKETS
Michel Cressy-Renoma, 78 bld Victor-Hugo, Neuilly, France 92200
Filed Mar. 8, 1983, Ser. No. 473,324
Claims priority, application France, Sep. 28, 1982, 823273
Term of patent 14 years
U.S. Cl. D2—28

281,637
ONE-PIECE COAT-LIKE SHIRT
James Stubrick, 814 Enterprise St., McKeesport, Pa. 15132
Filed Dec. 4, 1981, Ser. No. 327,414
Term of patent 14 years
U.S. Cl. D2—184

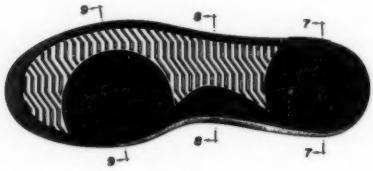
281,638
APRON
Carol J. Thomas, Rte. 2, Box 456, Hillsboro, Oreg. 97123
Filed Aug. 12, 1983, Ser. No. 522,510
Term of patent 14 years
U.S. Cl. D2—229

281,639
ANGLE FLAPPED POCKETED ATHLETIC SHOE
Robert J. Gamm, St. Louis County, Mo., assignor to Kangaroos U.S.A., Inc., St. Louis, Mo.
Continuation-in-part of Ser. No. 427,637, Sep. 29, 1982, which is a continuation-in-part of Ser. No. 297,337, Aug. 28, 1981, and a continuation-in-part of Ser. No. 297,338, Aug. 28, 1981, which is a continuation-in-part of Ser. No. 107,093, Dec. 26, 1979, Pat. No. Des. 261,823. This application Apr. 1, 1983, Ser. No. 481,166
Term of patent 14 years
U.S. Cl. D2—309



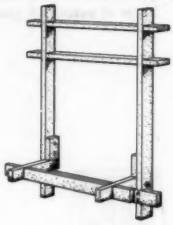
281,640
BASKETBALL SHOE
Robert J. Gamm, St. Louis, Mo., assignor to Kangaroos U.S.A., Inc., St. Louis, Mo.
Filed Jan. 6, 1983, Ser. No. 455,950
Term of patent 14 years
U.S. Cl. D2—310

281,641
SHOE SOLE
Junichiro Shiki, Ogoori, Japan, assignor to Nippon Rubber Co., Ltd., Tokyo, Japan
Filed Jul. 18, 1983, Ser. No. 514,832
Claims priority, application Japan, Jan. 20, 1983, 58-2243
Term of patent 14 years
U.S. Cl. D2—320



281,642
SHOE SOLE
Shosiro Fuzita, Kurume, Japan, assignor to Nippon Rubber Co., Ltd., Tokyo, Japan
Filed Jul. 18, 1983, Ser. No. 514,834
Claims priority, application Japan, Jan. 25, 1983, 58-2609
Term of patent 14 years
U.S. Cl. D2—320

281,643
BACKPACK CARGO FRAME OR THE LIKE
Thomas Anderson, 25 SW. 97th St., Portland, Oreg. 97225
Filed May 23, 1983, Ser. No. 497,265
Term of patent 14 years
U.S. Cl. D3—32



281,644
CAMERA CASE
Jun Akabane, Kawasaki, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan
Filed Jul. 25, 1983, Ser. No. 516,891
Claims priority, application Japan, Jan. 31, 1983, 58-3370
Term of patent 14 years
U.S. Cl. D3—33

281,645

SOFT-SIDED TOTE BAG

Harvey Bomes, Wellesley Hill; John Pulichino, Wellesley; Jack Barber, Cambridge, and Max Bell, Milford, all of Mass., assignors to American Tourister, Inc., Warren, R.I.

Filed Aug. 31, 1983, Ser. No. 528,041

Term of patent 14 years

U.S. Cl. D3—48

281,646

DUFFLE LUGGAGE

Harvey Bomes, Wellesley Hills; John Pulichino, Wellesley, both of Mass.; John Migliore, Barrington, R.I., and Jack Barber, Cambridge, Mass., assignors to American Tourister, Inc., Warren, R.I.

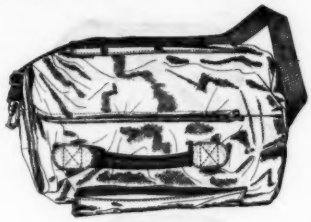
Filed Aug. 18, 1983, Ser. No. 524,160

Term of patent 14 years

U.S. Cl. D3—71

281,647
DUFFLE LUGGAGE
Harvey Bomes, Wellesley Hills; John Pulichino, Wellesley, both of Mass.; John Migliore, Barrington, R.I., and Jack Barber, Cambridge, Mass., assignors to American Tourister, Inc., Warren, R.I.
Filed Aug. 18, 1983, Ser. No. 524,205
Term of patent 14 years
U.S. Cl. D3—71

281,648
DUFFLE LUGGAGE
Harvey Bomes, Wellesley Hills; John Pulichino, Wellesley, both of Mass.; John Migliore, Barrington, R.I., and Jack Barber, Cambridge, Mass., assignors to American Tourister, Inc., Warren, R.I.
Filed Aug. 18, 1983, Ser. No. 524,206
Term of patent 14 years
U.S. Cl. D3—71



281,649
DUFFLE LUGGAGE
Harvey Bomes, Wellesley Hills; John Pulichino, Wellesley, both of Mass.; John Migliore, Barrington, R.I., and Jack Barber, Cambridge, Mass., assignors to American Tourister, Inc., Warren, R.I.
Filed Aug. 18, 1983, Ser. No. 524,207
Term of patent 14 years
U.S. Cl. D3—71

281,650

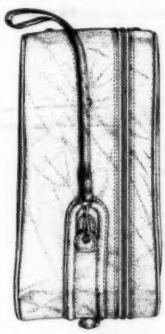
SOFT-SIDED WHEELED SUITCASE

Harvey Bomes, Wellesley Hill; John Pulichino, Wellesley; Jack Barber, Cambridge, and Max Bell, Milford, all of Mass., assignors to American Tourister, Inc., Warren, R.I.

Filed Aug. 3i, 1983, Ser. No. 527,994

Term of patent 14 years

U.S. Cl. D3—71



281,651

GARMENT BAG

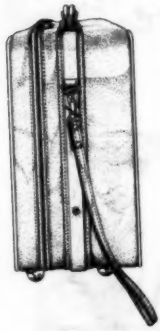
Harvey Bomes, Wellesley Hills; John Pulichino, Wellesley; Jack Barber, Cambridge, all of Mass., and John Migliore, Barrington, R.I., assignors to American Tourister, Inc., Warren, R.I.

Filed Aug. 31, 1983, Ser. No. 527,995

Term of patent 14 years

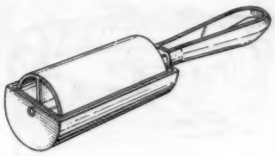
U.S. Cl. D3—71

281,652
SOFT-SIDED WHEELED SUITCASE
Harvey Bomes, Wellesley Hills; John Pulichino, Wellesley; Jack Barber, Cambridge, all of Mass., and John Migliore, Barrington, R.I., assignors to American Tourister, Inc., Warren, R.I.
Filed Aug. 31, 1983, Ser. No. 528,174
Term of patent 14 years
U.S. Cl. D3—71

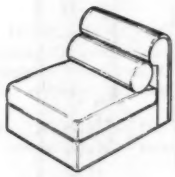


281,653
TOOTHBRUSH
William E. Baity, 1202 Mear La., Tustin, Calif. 92680
Continuation of Ser. No. 116,296, Jan. 28, 1980, abandoned. This application Mar. 9, 1982, Ser. No. 356,527
Term of patent 14 years
U.S. Cl. D4—108

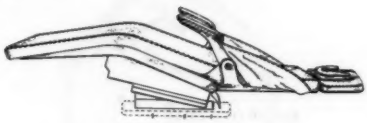
281,654
DEVICE FOR REMOVING LINT FROM TEXTILE GOODS
Tommy Bladh, Bredaryd, and Bill Hansson, Malmo, both of Sweden, assignors to Fastighets AB Leif Eriksson, Malmo, Sweden
Filed Nov. 3, 1982, Ser. No. 438,914
Claims priority, application Sweden, May 5, 1982, 82-1169
Term of patent 14 years
U.S. Cl. D4—122



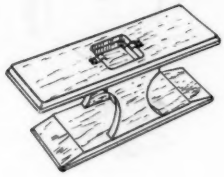
281,655
CHAIR
Roland Carter, Lynchburg, Va., assignor to Erwin-Lambeth, Inc., Thomasville, N.C.
Filed Apr. 8, 1983, Ser. No. 483,107
Term of patent 14 years
U.S. Cl. D6—334



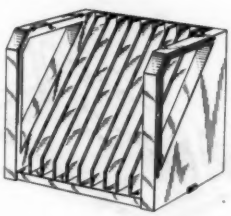
281,656
SEATING UNIT FOR A PATIENT'S CHAIR
Randall N. Bartlett; James H. Broadhead, and Lawrence A. Wilbur, all of Bay Minette, Ala., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.
Continuation-in-part of Ser. No. 439,656, Nov. 5, 1982, abandoned. This application Apr. 15, 1983, Ser. No. 483,395
Term of patent 14 years
U.S. Cl. D6—361



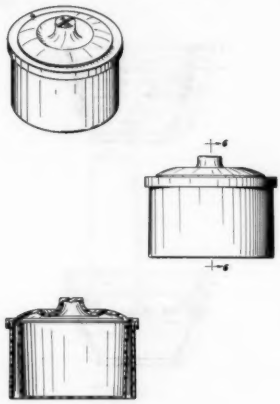
281,657
LAP MOUNTED JOYSTICK HOLDER
Edward L. Roczey, 1740 Hillsdale La., El Cajon, Calif. 92021
Filed Jun. 10, 1983, Ser. No. 503,340
Term of patent 14 years
U.S. Cl. D6—406



281,658
STORAGE RACK
Fumitaka Kikutani, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Mar. 29, 1983, Ser. No. 479,870
Claims priority, application Japan, Oct. 4, 1982, 57-45234
Term of patent 14 years
U.S. Cl. D6—407



281,659
COVERED CROCK FOR FOODS OR THE LIKE
William J. Williams, Shelbyville, Ind., assignor to Williams Industries, Inc., Shelbyville, Ind.
Filed Jun. 1, 1983, Ser. No. 500,185
Term of patent 14 years
U.S. Cl. D7—17



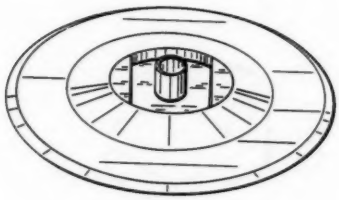
281,660
FOOD WARMING DISH OR SIMILAR ARTICLE
Robert P. Trudeau, and Abigail H. Gallagher, both of Chicago, Ill., assignors to American Hospital Supply Corporation, Evanston, Ill.
Filed Jun. 23, 1982, Ser. No. 391,428
Term of patent 14 years
U.S. Cl. D7—23

281,661
BOWL OR SIMILAR ARTICLE
Steve A. Unger, Manlius, N.Y., assignor to Syracuse China Corporation, Syracuse, N.Y.
Division of Ser. No. 379,174, May 17, 1982, Pat. No. Des. 274,969. This application Mar. 23, 1984, Ser. No. 592,847
Term of patent 14 years
U.S. Cl. D7—28

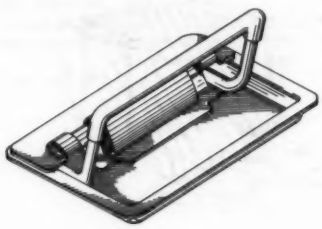
281,662
STAPLE PULLER
Georg Augustin, 11 Briarwood, Hidden Valley Estates, Middletown, N.Y. 10940
Filed Mar. 28, 1983, Ser. No. 479,828
Term of patent 14 years
U.S. Cl. D8—48

281,663
CIRCULAR SAW
Hitoshi Tsuru, 784-2, Fuchu-cho, Fuchu-shi, Hiroshima-ken, and Tetsuyuki Doi, 35-24, Managura, Ekiya-cho, Fukuyama-shi, Hiroshima-ken, both of Japan
Filed May 20, 1983, Ser. No. 496,441
Claims priority, application Japan, Nov. 29, 1982, 57-53875
Term of patent 14 years
U.S. Cl. D8—66

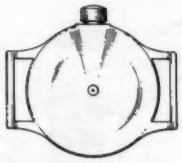
281,664
PORTABLE ROTOR VISE
Daniel G. Crotty, San Jose, and Hugh O. Brown, Campbell, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.
Filed Jul. 6, 1982, Ser. No. 395,400
Term of patent 14 years
U.S. Cl. D8—74



281,665
COMBINED LATCH OPERATING HANDLE AND HANDLE HOUSING
Lee S. Weinerman, Strongsville; Michael J. Rachocki, Brecksville, and Donald J. Dignan, South Euclid, all of Ohio, assignors to The Eastern Company, Cleveland, Ohio
Filed Jul. 20, 1983, Ser. No. 515,934
Term of patent 14 years
U.S. Cl. D8—302



281,666
DISPENSER FOR LIQUIDS OR THE LIKE
James P. Fay, Sr., and James P. Fay, Jr., both of Keene, N.H., assignors to Pro-Tex Limited Partnership, Keene, N.H.
Filed Sep. 2, 1983, Ser. No. 529,322
Term of patent 14 years
U.S. Cl. D9—300



281,667
COMBINED BAG AND SUPPORTING STRUCTURE
Richard Durbin, Hill Farm House, North Marston, Buckinghamshire, England
Filed Dec. 30, 1982, Ser. No. 454,637
Claims priority, application United Kingdom, Dec. 8, 1982, 1010165
Term of patent 14 years
U.S. Cl. D9—305

281,668
PACKAGING CONTAINER FOR WINE
Philippe Berard, Champagne au Mont d'Or, France, assignor to Centrale Vinicole Lyonnaise, Lyons, France
Filed Dec. 28, 1982, Ser. No. 453,987
Claims priority, application France, Jun. 29, 1982, 82 2429
Term of patent 14 years
U.S. Cl. D9—322

281,669
COMBINED COSMETIC CONTAINER AND APPLICATOR
Ted I. Kingsford, Memphis, Tenn., assignor to Plough, Inc., Memphis, Tenn.
Filed Mar. 21, 1983, Ser. No. 477,095
The portion of the term of this patent subsequent to Jun. 18, 1999, has been disclaimed.
Term of patent 14 years
U.S. Cl. D9—338

281,670
BOTTLE
Francois Thieffry, Meigneux, France, assignor to Societe d'etudes de Chimie et de Therapie Appliquees Laboratoires de Cosmetologue Yves Rocher, La Gacilly, France
Filed Jun. 6, 1983, Ser. No. 501,706
Claims priority, application France, Dec. 30, 1982, 8 24600
Term of patent 14 years
U.S. Cl. D9—352

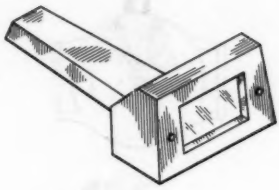
281,671
NAIL ENAMEL CONTAINER
Marcel Buchet, Paris, France, assignor to l'Oreal, S.A., Paris, France
Filed May 17, 1983, Ser. No. 495,479
Term of patent 14 years
U.S. Cl. D9—372

281,672
BOTTLE FOR COSMETIC PRODUCTS OR THE LIKE
Alain De Mourgues, Paris, France, assignor to Hanorah Italiana S.P.A., Milan, Italy
Filed Jul. 13, 1983, Ser. No. 513,221
Claims priority, application Italy, Apr. 7, 1983, 21451 B/83
Term of patent 14 years
U.S. Cl. D9—385

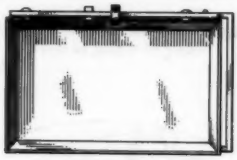
281,673
PACKAGING CONTAINER
Deirdre A. Lampe, Sydney, Australia, assignor to Magic Products Corporation Pty. Limited, Sydney, Australia
Filed Dec. 13, 1982, Ser. No. 449,246
Term of patent 14 years
U.S. Cl. D9—398

281,674
SWEAT BAND WRIST WATCH
Mickey Novak, Del Mar, Calif., assignor to Innovative Time Corporation, Carlsbad, Calif.
Filed Sep. 13, 1984, Ser. No. 649,991
Term of patent 14 years
U.S. Cl. D10—31

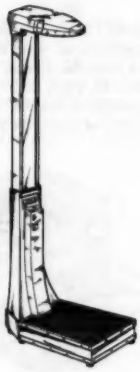
281,675
TIMER
Harold B. Rapp, Williston Park, N.Y., and Peter D. Galitzine, New Providence, N.J., assignors to North American Philips Corporation, New York, N.Y.
Filed Aug. 8, 1983, Ser. No. 521,502
Term of patent 14 years
U.S. Cl. D10—40



281,676
PORTABLE PIGLET SCALE
Hensel B. Peterson, Garnavillo, Iowa, assignor to Nordic Forge, Inc., Guttenberg, Iowa
Filed Jan. 6, 1984, Ser. No. 568,830
Term of patent 14 years
U.S. Cl. D10—87

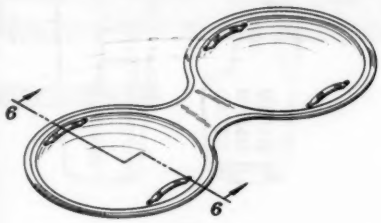


281,677
COMPUTERIZED MEASURING MACHINE FOR WEIGHT, HEIGHT AND TEMPERATURE
Lin-Fu Chen, 4th Fl., 17, Lane 133, Pao Pyng Rd., Yuan Ho City, Taiwan
Filed Oct. 12, 1983, Ser. No. 541,123
Term of patent 14 years
U.S. Cl. D10—88

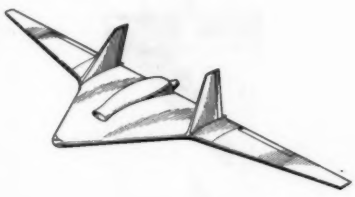


281,678
APPLIQUE ORNAMENT OR THE LIKE
Brigitte Breyer-Lindner, Habichtstrasse 34, D-8025 Unterhaching, Fed. Rep. of Germany
Filed May 10, 1982, Ser. No. 376,269
Claims priority, application Fed. Rep. of Germany, Nov. 16, 1981, 11 AR 3760/81
Term of patent 14 years
U.S. Cl. D11—133

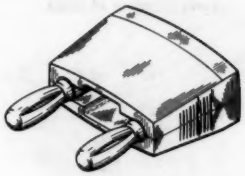
281,679
TANDEM SLED
John L. Marquesen, Minnetonka, Minn., assignor to Spearhead Industries, Inc., Minneapolis, Minn.
Filed Sep. 29, 1982, Ser. No. 427,676
Term of patent 14 years
U.S. Cl. D12—11



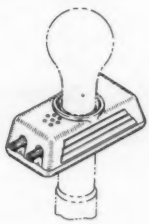
281,680
AIRPLANE
Charles Henderson, 8308 Cagle Rd., Fort Washington, Md. 20744
Filed Apr. 8, 1982, Ser. No. 366,666
Term of patent 14 years
U.S. Cl. D12—333



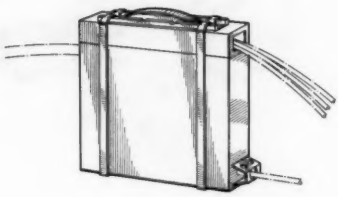
281,681
DUAL BANANA PLUG
Fred M. Kaufman, Bricktown, N.J., assignor to North American Philips Corporation, New York, N.Y.
Filed Dec. 29, 1982, Ser. No. 454,407
Term of patent 14 years
U.S. Cl. D13—24



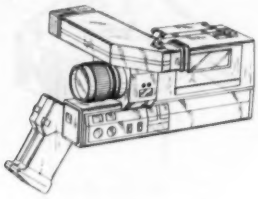
281,682
LIGHT SWITCH HOUSING
Harry J. Pfeiffer, Jr., Gibbstown, N.J., assignor to Chrisdon, Inc., Somerdale, N.J.
Filed Apr. 1, 1983, Ser. No. 481,404
Term of patent 14 years
U.S. Cl. D13—25



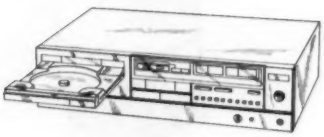
281,683
RESISTOR COOLANT CONTAINER
Bent P. Simonsen, 27 Starfish Ct., Newport Beach, Calif. 92663
Filed Jul. 26, 1982, Ser. No. 401,850
Term of patent 14 years
U.S. Cl. D13—40



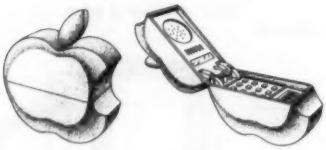
281,684
COMBINED VIDEO TAPE RECORDER AND VIDEO CAMERA
Hideyo Hyuga, Tokyo; Yukinobu Ichikawa, Kodaira; Yukio Kuroiwa, Tokyo; Shigeki Masatsugu, Sayama, and Fumio Toyoda, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Aug. 5, 1983, Ser. No. 520,841
Claims priority, application Japan, Feb. 25, 1983, 58-7258
Term of patent 14 years
U.S. Cl. D14—5



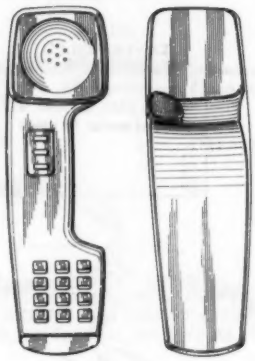
281,685
AUDIO DISC PLAYER
Eiji Takahashi, Koganei; Mamoru Mori, Kokubunzi, and Takao Itoh, Tachikawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Aug. 5, 1983, Ser. No. 520,686
Claims priority, application Japan, Mar. 25, 1983, 58-11985
Term of patent 14 years
U.S. Cl. D14—14



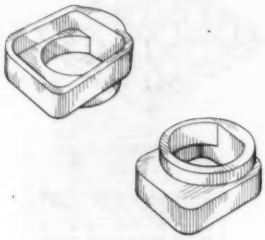
281,686
TELEPHONE
Denni F. Rivette, Chicago, and Harry Disko, South Barrington, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.
Filed Nov. 26, 1982, Ser. No. 444,601
Term of patent 14 years
U.S. Cl. D14—53



281,687
TELEPHONE SET
Toshihiko Sakow, Teaneck, N.J., assignor to Telelogic, Inc., Somerville, Mass.
Filed Jun. 14, 1983, Ser. No. 504,366
Term of patent 14 years
U.S. Cl. D14—53

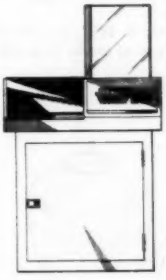


281,688
CUP FOR AN ACOUSTICAL COUPLER
Edward J. Owens, Jr., Boulder, Colo., assignor to CK Marketing, Inc., Boulder, Colo.
Filed Jan. 10, 1983, Ser. No. 456,856
Term of patent 14 years
U.S. Cl. D14—57

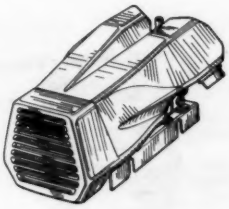


281,689
KEYBOARD HOUSING
Peter A. Peroni, Pottstown, Pa., assignor to LaFrance Corporation, Philadelphia, Pa.
Filed Jun. 10, 1982, Ser. No. 386,992
Term of patent 14 years
U.S. Cl. D14—100

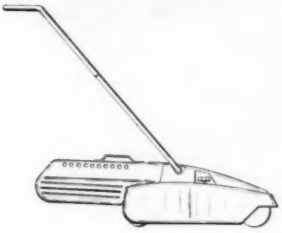
281,690
CONTROL CONSOLE
William J. Thomas, Boston, Mass., assignor to Automation, Inc., Needham, Mass.
Filed May 2, 1983, Ser. No. 490,530
Term of patent 14 years
U.S. Cl. D14—102



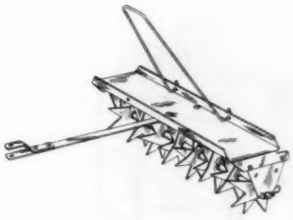
281,691
AIR COMPRESSOR
Alberto Vitaloni, Turin, Italy, assignor to Balma S.p.A., Italy
Filed Oct. 11, 1983, Ser. No. 541,390
Claims priority, application Italy, Apr. 11, 1983, 53176/83[U]
Term of patent 14 years
U.S. Cl. D15—9



281,692
HOUSING FOR A LAWN MOWER
Kazuharu Nakamura, Aichi, Japan, assignor to Toyotomi Kogyo Co., Ltd., Aichi, Japan
Filed Aug. 23, 1983, Ser. No. 525,727
Claims priority, application Japan, Feb. 23, 1983, 58-7452
Term of patent 14 years
U.S. Cl. D15—14



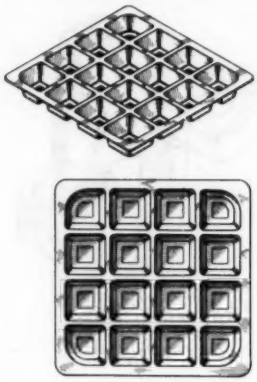
281,693
PULLED AERATOR
Charles W. Doering, Louisville, Ky., assignor to Brinly-Hardy Co., Inc., Louisville, Ky.
Filed Dec. 29, 1983, Ser. No. 566,509
Term of patent 14 years
U.S. Cl. D15—27



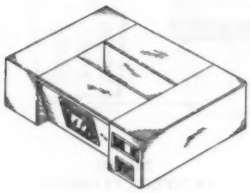
281,694
PORTABLE BEVERAGE COOLER
Delvin R. Ryan, Jr., Lake Forest, Ill., assignor to Ingrid, Ltd., Chicago, Ill.
Filed Sep. 19, 1983, Ser. No. 533,588
Term of patent 14 years
U.S. Cl. D15—77

281,695
PORTABLE COOLER
Delvin R. Ryan, Jr., Lake Forest, Ill., assignor to Ingrid, Ltd., Chicago, Ill.
Filed Sep. 19, 1983, Ser. No. 533,589
Term of patent 14 years
U.S. Cl. D15—77

281,696
ICE CUBE TRAY
William Barnhart, 629 Ransom, Ripon, Wis. 54971
Filed Jun. 3, 1983, Ser. No. 500,837
Term of patent 14 years
U.S. Cl. D15—90

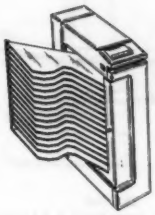


281,697
DISPLAY CABINET FOR ARMATURE WINDING MACHINES OR THE LIKE
Alvin C. Banner, Kettering; Hyman B. Finegold, Dayton, and David R. Seitz, Vandalia, all of Ohio, assignors to The Globe Tool & Engineering Company, Dayton, Ohio
Filed Jun. 17, 1983, Ser. No. 505,247
Term of patent 14 years
U.S. Cl. D15—138

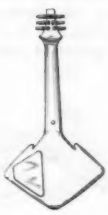


281,698
INGOT
Bobby W. Ryan, Houston, Tex., assignor to WFI International, Inc., Houston, Tex.
Filed Mar. 15, 1983, Ser. No. 473,402
Term of patent 14 years
U.S. Cl. D15—144

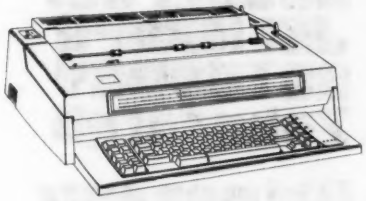
281,699
SORTER
Harumi Fukuda, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Nov. 29, 1983, Ser. No. 555,932
Claims priority, application Japan, May 31, 1983, 58-23575
Term of patent 14 years
U.S. Cl. D16—32

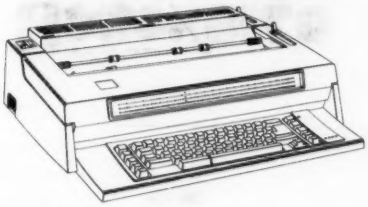


281,700
GUITAR OR SIMILAR ARTICLE
Gary Egnatski, Hicksville, N.Y., assignor to Anne Egnatski, Bronx, N.Y.
Filed Aug. 3, 1983, Ser. No. 519,933
Term of patent 14 years
U.S. Cl. D17—19



281,701
ELECTRONIC TYPEWRITER
James P. Wang, Lexington, Ky., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Sep. 29, 1983, Ser. No. 537,222
Term of patent 14 years
U.S. Cl. D18—1

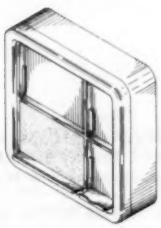


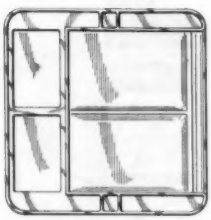


281,702
COMBINED POINT-OF-SALE CASH REGISTER AND SUPPORT CABINET THEREFOR
Kunio Akiyama, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Oct. 15, 1982, Ser. No. 434,593
Term of patent 14 years
U.S. Cl. D18—4

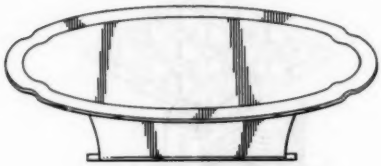
281,703
FONT OF TYPE
Rudolph Shepherd, 1208 Sheridan Ave., Chattanooga, Tenn. 37406
Filed May 18, 1984, Ser. No. 611,636
Term of patent 14 years
U.S. Cl. D18—24

281,704
COMBINED BULLETIN BOARD, TELEPHONE BOOK AND PAD HOLDER
Ross Deacon, Syracuse, N.Y., assignor to Syroco, Inc., Syracuse, N.Y.
Filed May 13, 1983, Ser. No. 494,355
Term of patent 14 years
U.S. Cl. D19—52

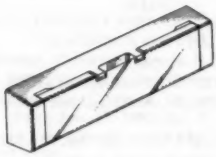


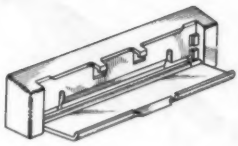


281,705
DOOR PLATE
William L. Rosenberg, 36725 Hull Rd., Lisbon, Ohio 44432
Filed Mar. 25, 1983, Ser. No. 478,992
Term of patent 14 years
U.S. Cl. D20—15



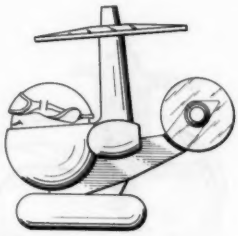
281,706
IDENTIFICATION HOLDER FOR A LUGGAGE CASE OR THE LIKE
Roger D. Winter, Lakewood; James S. Gregg, Aurora, and Daniel R. Skewis, Westminster, all of Colo., assignors to Samsonite Corporation, Denver, Colo.
Filed Jul. 25, 1983, Ser. No. 516,749
Term of patent 14 years
U.S. Cl. D20—43



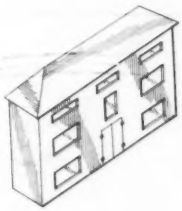


281,707
BUBBLE FORMING DEVICE
Jerry Jernigan, 227 Dink La., SE., Marietta, Ga. 30060
Filed Sep. 22, 1983, Ser. No. 534,613
Term of patent 14 years
U.S. Cl. D21—61

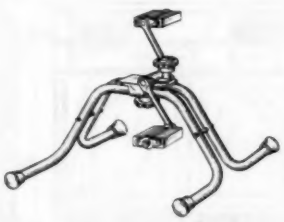
281,708
TOY HELICOPTER
James F. Mariol, 481 Dean View Dr., Cincinnati, Ohio 45224
Filed Sep. 1, 1983, Ser. No. 528,613
Term of patent 14 years
U.S. Cl. D21—85



281,709
TOY DOLL HOUSE
Susan E. M. Vigil, 1265 Race St., Apartment 705, Denver, Colo. 80206
Filed Apr. 19, 1983, Ser. No. 486,326
Term of patent 14 years
U.S. Cl. D21—114

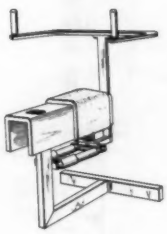


281,710
BICYCLE EXERCISER
John R. Kirby, Short Hills, N.J., assignor to J. A. Preston Corporation, Clifton, N.J.
Filed May 23, 1984, Ser. No. 612,968
Term of patent 14 years
U.S. Cl. D21—194



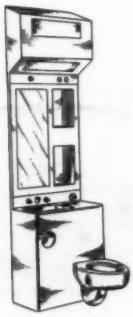
281,711
BICYCLE EXERCISER
Jouni J. Hiivola, Naantali, Finland, assignor to Tunturipyora Oy, Naantali, Finland
Filed Feb. 24, 1983, Ser. No. 469,267
Claims priority, application Finland, Aug. 26, 1982, 726/82
Term of patent 14 years
U.S. Cl. D21—194

281,712
TORSION EXERCISING APPARATUS
Robert E. Stedman, 1040 Ceder Hill Dr., Jackson, Miss. 39206
Filed May 31, 1983, Ser. No. 499,334
Term of patent 14 years
U.S. Cl. D21—195

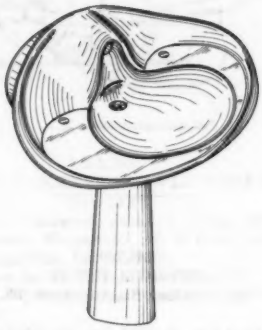


281,713
FLAPPER FLUSH VALVE FOR TOILET TANKS
Erwin F. Mikol, Park Ridge, Ill., assignor to Beatrice Companies, Inc., Chicago, Ill.
Filed Feb. 7, 1983, Ser. No. 464,191
Term of patent 14 years
U.S. Cl. D23—19

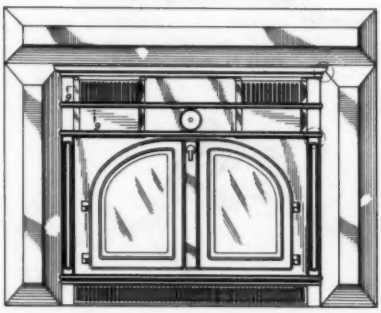
281,714
TAMPER-PROOF LAVATORY AND TOILET UNIT
Earl L. Morris, 1501 Cloister Dr., La Habra Hts., Calif. 90631; V. Walter Hafner, 15939 Ocean Ave., Whittier, Calif. 90604, and Theodore J. Sally, 2607 S. Brush St., Graton, Calif. 95444
Filed Jan. 5, 1983, Ser. No. 455,665
Term of patent 14 years
U.S. Cl. D23—49



281,715
LAVATORY
Joseph W. Platner, Guilford, Conn., assignor to American Standard Inc., New York, N.Y.
Filed Mar. 18, 1983, Ser. No. 476,695
Term of patent 14 years
U.S. Cl. D23—61



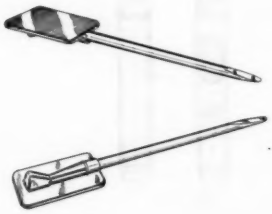
281,716
FIREPLACE STOVE FACADE UNIT
David W. Aseltine, Rte. #1, Box 4030, Waterbury Center, Vt. 05677
Filed Dec. 22, 1983, Ser. No. 564,568
Term of patent 14 years
U.S. Cl. D23—128



281,717
HEAT EXCHANGER WITH GAS VENTING MEANS
Todor Pavlov, Laguna Niguel, and Badri Gupta, Los Angeles, both of Calif., assignors to Shiley Incorporated, Irvine, Calif.
Filed Feb. 24, 1982, Ser. No. 351,800
Term of patent 14 years
U.S. Cl. D23—136

281,718
DENTAL MIRROR
Harald Holstad, N-8643 Bjerka, Norway
Filed May 18, 1983, Ser. No. 495,607
Claims priority, application Norway, Nov. 18, 1982, 63 487
Term of patent 14 years
U.S. Cl. D24—13

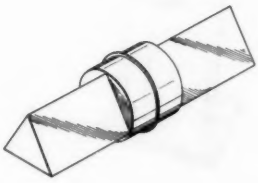
281,719
DENTAL COMPOSITE UNIT DOSE CONTAINER WITH ATTACHED MIXING STICK
Robert D. Holewinski, Lakehurst; Leslie Hamilton, Trenton, and William J. Blatherwick, Hamilton Square, all of N.J., assignors to Johnson & Johnson Dental Products Company, East Windsor, N.J.
Filed Jan. 26, 1983, Ser. No. 460,975
Term of patent 14 years
U.S. Cl. D24—16



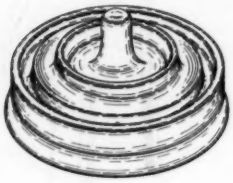
281,720
TONGUE CLEANER
Sandra J. Tiwari, 58 Andover Dr., Coram, N.Y. 11727
Filed Dec. 16, 1983, Ser. No. 562,297
Term of patent 14 years
U.S. Cl. D24—23

281,721
SURGICAL PUNCH
Timothy M. Scanlan, St. Paul, Minn., assignor to Scanlan International, Inc., St. Paul, Minn.
Filed Jan. 14, 1983, Ser. No. 458,070
Term of patent 14 years
U.S. Cl. D24—28

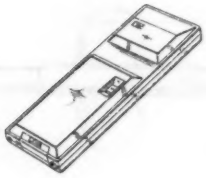
281,722
MAGNETIZABLE ROTOR FOR LIQUID TREATMENT APPARATUS
Alan Carrol, London, England, assignor to Trenchbond Limited, London, England
Filed May 17, 1982, Ser. No. 378,819
Claims priority, application United Kingdom, Nov. 21, 1981, 1003763
Term of patent 14 years
U.S. Cl. D24—29



281,723
REFLEX MASSAGER
Peder B. Alstead, 1227 S. Washington St., Tacoma, Wash. 98405
Filed Mar. 16, 1983, Ser. No. 475,863
Term of patent 14 years
U.S. Cl. D24—36

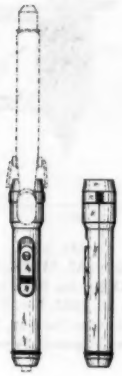


281,724
ELECTROMAGNETIC STIMULATOR
Christian Michiels, Everberg, Belgium, assignor to I.S.E.C. Ltd., Industrial Supplies and Engineering Co., London, England
Filed Mar. 25, 1983, Ser. No. 478,909
Claims priority, application Canada, Jan. 11, 1983, 11-01-83-2
Term of patent 14 years
U.S. Cl. D24—41



281,725
WORKSTAND LAMP
Charles P. Schreiner, 346 Mary St., Box 711, Saugatuck, Mich. 49453
Filed Aug. 22, 1983, Ser. No. 525,163
Term of patent 14 years
U.S. Cl. D26—93

281,726
HANDLE FOR A BEAUTY CARE APPLIANCE OR THE LIKE
Masao Tsuji, Old Lyme, Conn., assignor to North American Philips Corporation, New York, N.Y.
Filed Jul. 1, 1983, Ser. No. 509,619
Term of patent 14 years
U.S. Cl. D28—35



281,727
HANDLE FOR A BEAUTY CARE APPLIANCE OR THE LIKE
Masao Tsuji, Old Lyme, Conn., assignor to North American Philips Corporation, New York, N.Y.
Filed Jul. 1, 1983, Ser. No. 509,622
Term of patent 14 years
U.S. Cl. D28—35

281,728

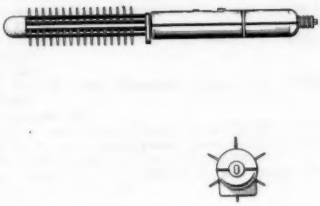
HEATED HAIR BRUSH

Wilfred M. Sherman, Boston, Mass., assignor to The Shetland Company, Inc., Chelsea, Mass.

Filed Aug. 4, 1983, Ser. No. 520,420

Term of patent 14 years

U.S. Cl. D28—35



281,729

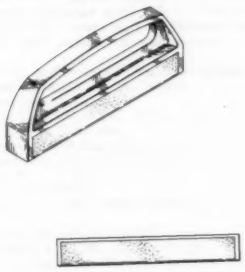
NAIL BUFFER OR THE LIKE

Rolf Mast, Chino, Calif., assignor to Lee Pharmaceuticals, Inc., South El Monte, Calif.

Filed Feb. 3, 1984, Ser. No. 576,758

Term of patent 14 years

U.S. Cl. D28—59



281,730

OCTAGONAL COSMETIC CASE WITH A DRAWER

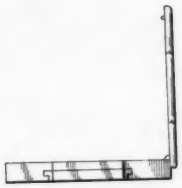
Oanh P. Phu, Hohenzollernstrabe 97, D-8000 Munchen 40, Fed. Rep. of Germany

Filed Jul. 12, 1983, Ser. No. 513,105

Claims priority, application Fed. Rep. of Germany, Jan. 12, 1983, 11 AR 126/83

Term of patent 14 years

U.S. Cl. D28—78



281,731

RECTANGULAR COSMETIC CASE WITH A DRAWER

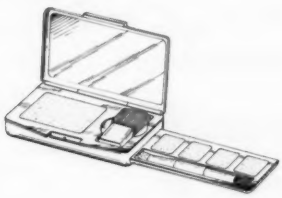
Oanh P. Phu, Hohenzollernstrabe 97, D-8000 Munchen 40, Fed. Rep. of Germany

Filed Jul. 12, 1983, Ser. No. 513,106

Claims priority, application Fed. Rep. of Germany, Jan. 12, 1983, 11 AR 126/83

Term of patent 14 years

U.S. Cl. D28—83



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TO WHOM

PATENTS WERE ISSUED ON THE 10TH DAY OF DECEMBER, 1985

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. Ahlstrom Osakeyhtio: *See—*
Sundman, Frey, 4,557,120, Cl. 68-58.000.
Waris, Veikko K. T., 4,557,802, Cl. 162-264.000.

A. E. Staley Manufacturing Company: *See—*
McDaniel, Robert S., Jr.; Glor, Paul R.; and Kickle, Hunter L., 4,557,729, Cl. 8-111.000.
Verbanac, Frank, 4,557,951, Cl. 527-312.000.

A. H. Robins Company, Incorporated: *See—*
Shanklin, James R., Jr.; and Johnson, Christopher P., III, 4,558,155, Cl. 564-27.000.
Taylor, Chandler R., Jr.; and Lo, Young S., 4,558,132, Cl. 546-262.000.

AB Ferrosan: *See—*
Lindanl, Ake R.; and Erlandsson, Stig A. B., 4,557,925, Cl. 424-19.000.

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Bauer, John F.; and Shada, Douglas M., 4,558,070, Cl. 514-557.000.
Hung, Paul P.; Lee, Shaw-Guang; Roychoudhury, Ranajit; and Ratzkin, Barry J., 4,558,010, Cl. 435-212.000.
Reynolds, Gordon S.; Todd, Robert J.; and Russell, Edward J., 4,557,269, Cl. 128-675.000.

Abe, Wataru: *See—*
Kitta, Toshiyuki; and Abe, Wataru, 4,557,087, Cl. 52-230.000.

Abel, Peter T.: *See—*
Memmer, Timothy I.; and Abel, Peter T., 4,557,977, Cl. 428-421.000.

Abo, Keiju: *See—*
Tanaka, Yoshikazu; Yamamuro, Sigeaki; Abo, Keiju; Hirano, Hiroyuki; Kumura, Haruyoshi; and Morimoto, Yoshiro, 4,557,706, Cl. 474-28.000.

Abrams, Lloyd W.: *See—*
Mitch, David S.; Abrams, Lloyd W.; Arnold, Jerry L.; Caudill, Forrester; Compton, Thomas A.; and Boston, Steven L., 4,557,952, Cl. 427-432.000.

Abuyama, Yasuo, to Kabushiki Kaisha Toshiba. Return speed control system for use in a document scanning apparatus. 4,557,585, Cl. 355-8.000.

ACF Industries, Incorporated: *See—*
Fischer, Robert L.; Pulcrano, Frank C.; Coldiron, Lee C.; Topping, Terry M.; Potter, J. H.; and Owens, Robert H., 4,557,661, Cl. 414-730.000.

Ackerman, Jerome L.; Clark, Leland C., Jr.; and Thomas, Stephen R., to University of Cincinnati; and Children's Hospital Research Foundation. Methods for detecting and imaging a temperature of an object by nuclear magnetic resonance. 4,558,279, Cl. 324-315.000.

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Frenkel, Robert L., 4,557,387, Cl. 209-636.000.

Advanced Micro Devices, Inc.: *See—*
Rallapalli, Krishna; and Kaku, Shinkyo, 4,558,371, Cl. 358-261.000.

Advanced Semiconductor Materials America, Inc.: *See—*
Olson, Donald M.; Jackson, Norman L.; and Tong, Jerry E., 4,557,657, Cl. 414-180.000.
Rosler, Richard S.; and Engle, George M., 4,557,943, Cl. 427-38.000.

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Zanardo, Agostino, 4,557,083, Cl. 52-109.000.

af Ekenstam, Bo T.; Glantz, Per-Olof; and Larsson, Kare, to Biogram AB. Germicidal composition. 4,557,935, Cl. 424-130.000.

Agency of Industrial Science and Technology: *See—*
Kaneko, Makoto; Tachi, Susumu; and Komoriya, Kiyoshi, 4,558,215, Cl. 250-222.100.
Kikuchi, Keisuke; Morikawa, Takitaro; Shimada, Junichi; and Sakurai, Kenjiro, 4,557,566, Cl. 350-413.000.
Takayanagi, Takeshi; Suzuki, Shizuo; Minowa, Susumu; and Nozaki, Yoshihiko, 4,557,316, Cl. 164-517.000.

Agfa-Gevaert AG: *See—*
Wagensonner, Eduard; Ruf, Wolfgang; and Landsiedel, Thomas, 4,558,436, Cl. 365-230.000.

Agharkar, Shireesh A.: *See—*
Tuttle, Alan H.; Leonard, James K.; Agharkar, Shireesh A.; and Waggott, John, 4,557,664, Cl. 415-105.000.

Ahlers, Klaas: *See—*
Schupp, Eberhard; Loch, Werner; Osterloh, Rolf; and Ahlers, Klaas, 4,557,814, Cl. 204-181.700.

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Yonezawa, Keitaro, 4,557,371, Cl. 198-803.010.

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Ulbing, Otmar M., 4,557,153, Cl. 74-2.000.

Air Preheater Company, Inc., The: *See—*
Bellows, Kenneth O., 4,557,318, Cl. 165-10.000.

Air Products and Chemicals, Inc.: *See—*
Gussow, Stanley; Spence, David C.; and Schwartz, William A., 4,558,168, Cl. 585-324.000.
Marsella, John A.; and Pez, Guido P., 4,558,157, Cl. 564-132.000.
Nichols, James D.; Derby, Richard; von dem Bussche, Glenn T.; and Hannum, David A., 4,557,838, Cl. 252-8.55C.
Sircar, Shivaji; Conrad, Roger R.; and Ambs, William J., 4,557,736, Cl. 55-62.000.

Aisin Seiki Kabushiki Kaisha: *See—*
Haneda, Hideo; and Yamanaka, Minoru, 4,558,293, Cl. 335-255.000.
Takamiya, Sanshiro; Yoshizawa, Michisuke; and Suzuki, Akira, 4,556,997, Cl. 623-3.000.

Aizawa, Koki; Takizawa, Yoshiyuki; Haeno, Akira; and Motoyama, Akira, to Pioneer Electronic Corporation. Pickup level control device for a system for reading out recorded information. 4,558,213, Cl. 250-214.00R.

Akaba, Kunihisa: *See—*
Kudo, Shiro; and Akaba, Kunihisa, 4,557,936, Cl. 426-104.000.

Akademia Medyczna: *See—*
Brzosko, Witold; Janicki, Piotr; Laskowski, Zbigniew; Madalinski, Kazimierz; and Dabrowa, Andrzej, 4,558,011, Cl. 435-272.000.

Akita, Shigeyuki: *See—*
Kago, Yoshiyuki; and Akita, Shigeyuki, 4,558,321, Cl. 340-904.000.

Akiyama, Chuji, to Yokogawa Hokushin Electric Corporation. Ultrasonic flowmeter. 4,557,148, Cl. 73-861.280.

Akiyama, Susumu; Ito, Kenzo; Fukaya, Hiroyasu; Ogiso, Haruhiko; Hirabayashi, Yuji; and Kawamura, Takahide, to Nippondenso Co., Ltd.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Computer based engine control with lower priority interrupt requests generated in selected higher priority interrupt routines. 4,558,417, Cl. 364-431.110.

Akzo N.V.: *See—*
Willemsen, Stephanus; Weening, Willem E.; and Steenbergen, Anne, 4,557,967, Cl. 428-224.000.

Akzona Incorporated: *See—*
Zengel, Hans-Georg; Bergfeld, Manfred; and Eisenhuth, Ludwig, 4,558,135, Cl. 548-158.000.

Alameda Company, The: *See—*
Alameda, Melford N., 4,557,368, Cl. 198-313.000.

Alameda, Melford N., to Alameda Company, The. Field crop harvesting and packing machine. 4,557,368, Cl. 198-313.000.

Alba, Donald: *See—*
Pink, John J.; Prunty, Jeffrey L.; and Alba, Donald, 4,557,118, Cl. 62-382.000.

Alba-Waldensian, Inc.: *See—*
Whitney, William G., 4,557,381, Cl. 206-440.000.

Albertson, Clarence E., to Borg-Warner Chemicals, Inc. Electrochemical synthesis of zerovalent transition metal organophosphorus complexes. 4,557,809, Cl. 204-59.0QM.

Albring, Manfred: *See—*
Wiechert, Rudolf; Bittler, Dieter; Schleusener, Annerose; and Albring, Manfred, 4,558,041, Cl. 514-178.000.

Aldridge, Clyde L.: *See—*
Bearden, Roby, Jr.; and Aldridge, Clyde L., 4,557,822, Cl. 208-112.000.

Alexander, Willis R.: *See—*
Lindsay, Frederick E.; and Alexander, Willis R., 4,557,831, Cl. 210-232.000.

Alexandru, Lupu; and Odell, Peter G., to Xerox Corporation. Aqueous suspension polymerization process. 4,558,108, Cl. 526-340.000.

ALFA Farmaceutici S.p.a.: *See—*
Cannata, Vincenzo; and Tamagnone, Gian F., 4,557,866, Cl. 260-239.30P.

Alfonso Bialetti & Co., Fonderia in Conchiglia S.p.A.: *See—*
DePonti, Luigi, 4,557,187, Cl. 99-279.000.

Ali, Mohammad H., to United States Gypsum Company. Fire resistant gypsum board containing mineral wool fibers and method. 4,557,973, Cl. 428-404.000.

Allen, Norris K. Centralized airlock compartment unit. 4,557,320, Cl. 165-46.000.

Allen, Robert T.: *See—*
Karamon, Robert J.; and Allen, Robert T., 4,557,895, Cl. 420-587.000.

Allied Corporation: *See—*
Gupta, Arunava; West, Gary A.; and Yardley, James T., 4,558,017, Cl. 501-96.000.

Kotliar, Abraham M.; Sibilia, John P.; Hughes, Ronald H.; and Landy, Richard A., 4,558,019, Cl. 501-101.000.
Lofquist, Robert A.; Twilley, Ian C.; and Saunders, Peter R., 4,558,097, Cl. 525-183.000.
Ohtsuki, Tomonari; and Hirose, Takao, 4,557,545, Cl. 339-103.00M.
Pauwels, Michael A.; and Wright, Danny O., 4,558,416, Cl. 364-431.110.
Sorensen, Ian W., 4,557,857, Cl. 252-503.000.

Allis-Chalmers Corporation: *See*—
Smith, Richard L., 4,557,740, Cl. 55-440.000.

Allor, Richard L., to Ford Motor Company. Method of machine cutting silicon metal particulates with Si_3N_4. 4,557,244, Cl. 125-1.000.

Alpia S.A.: *See*—
Bruneau, Alain, 4,557,450, Cl. 248-162.100.

Alps Electric Co., Ltd.: *See*—
Shimada, Yutaka; Mukasa, Koichi; Hatanai, Takashi; and Nakashima, Keishi, 4,557,769, Cl. 148-31.550.

Alston, Julia M.: *See*—
Percic, Milan; Schoonderbeek, Hubertus J.; and Alston, Julia M., 4,557,583, Cl. 355-3.0TR.

Aluminum Company of America: *See*—
Levendusky, Thomas L.; and Benson, Arthur, 4,558,198, Cl. 219-10.55E.
Voegel, Robert L.; and Wright, Kenton B., 4,557,817, Cl. 204-286.000.

Alves, Ronald V., to Luxtron Corporation. Multiplexing and calibration techniques for optical signal measuring instruments. 4,558,217, Cl. 250-227.000.

Amada Company, Limited: *See*—
Tokiwa, Toru, 4,557,168, Cl. 83-56.000.
Yoneda, Akiyoshi, 4,557,172, Cl. 83-848.000.

Amada, Eiichi: *See*—
Morikawa, Yuichi; Saito, Kazuo; Amada, Eiichi; and Shirasu, Hirotoshi, 4,558,185, Cl. 179-170.0NC.

Amana Refrigeration, Inc.: *See*—
Pink, John J.; Prunty, Jeffrey L.; and Alba, Donald, 4,557,118, Cl. 62-382.000.

Ambs, William J.: *See*—
Sircar, Shivaji; Conrad, Roger R.; and Ambs, William J., 4,557,736, Cl. 55-62.000.

Amemori, Koichi; Takahashi, Yosuke; Miyazaki, Manabu; Tsukahara, Hiroaki; Kawabe, Toshihiko; and Banba, Toshio, to Yanmar Diesel Engine Co., Ltd. Fuel injection quantity controlling device for diesel engine with vertical crankshaft. 4,557,235, Cl. 123-367.000.

American Can Company: *See*—
Newsome, David L.; Rein, Arnold R.; Hoss, Bradley J.; and Schroeder, George O., 4,557,780, Cl. 156-244.110.

American Cyanamid Company: *See*—
Draney, Daniel R.; and Kohli, Dalip K., 4,558,078, Cl. 523-468.000.
Peake, Steven L., 4,558,163, Cl. 568-436.000.

American Hoechst Corporation: *See*—
Caines, R. Scott, 4,557,963, Cl. 428-156.000.

American Hospital Supply Corporation: *See*—
Schober, Robert C., 4,557,266, Cl. 128-419.0PG.

American Locker Security Systems, Inc.: *See*—
Stackhouse, Wells F., 4,557,365, Cl. 194-1.00G.

American National Red Cross: *See*—
Friedman, Leonard I., 4,557,717, Cl. 494-10.000.

American Radionic Co., Inc.: *See*—
Stockman, Robert M., 4,558,394, Cl. 361-306.000.

American Seating Company: *See*—
Walworth, Robert S.; Hinshaw, Jay; and LaBotz, Arnold H., 4,557,080, Cl. 52-9.000.

American Standard Inc.: *See*—
Hart, James E.; Spalding, Willard P.; and Kyllonen, Allen W., 4,557,181, Cl. 91-519.000.

Ameron, Inc.: *See*—
Dana, William R.; Friedrich, Ralph S.; and McKenney, John D., 4,557,788, Cl. 156-425.000.

Ames, Adolf: *See*—
Wagner, Alfred; and Ames, Adolf, 4,557,131, Cl. 72-273.000.

Ames, Edwin N.: *See*—
Castellaw, Gerald J.; Wigham, Ronald C.; and Ames, Edwin N., 4,557,310, Cl. 160-84.00R.

Amgen: *See*—
Rudman, Christopher G., 4,558,033, Cl. 514-4.000.

Amoco Corporation: *See*—
Goddin, Clifton S., Jr.; and Cabanaw, Boyd E., 4,557,911, Cl. 423-228.000.

AMP Incorporated: *See*—
Coller, James R.; and Coon, Paul A., 4,557,542, Cl. 339-59.00M.
Crowman, Stanley W. T.; Dornes, Bryan J.; Paukovits, Edward J., Jr.; Spong, Richard V.; and Talarico, Robert J., 4,557,044, Cl. 29-741.000.
Esser, Wilhelm C. J., 4,557,544, Cl. 339-97.00R.
McCleerey, Earl W.; and Root, John A., 4,557,543, Cl. 339-97.00P.
Olsson, Billy E., 4,558,397, Cl. 361-404.000.
Serrano, Pedro, 4,557,045, Cl. 29-747.000.
Thrush, Roger L., 4,557,548, Cl. 339-258.00P.

Ampex Corporation: *See*—
Williams, Marshall, 4,557,434, Cl. 242-189.000.

Amway Corporation: *See*—
Glover, David A., 4,557,928, Cl. 424-70.000.

Analog Devices, Incorporated: *See*—
Tuthill, Michael G.; and Minogue, Paschal, 4,558,242, Cl. 307-577.000.

Andersen, W. Lee: *See*—
Violett, Robert S.; and Andersen, W. Lee, 4,557,107, Cl. 60-269.000.

Anderson, Garth R.; Manly, Kenneth F.; and Mittelman, Arnold, to Health Research, Inc. (Roswell Park Divison). Process for detecting LDH_5 isozyme activity in human serum for use as a diagnostic aid and for monitoring response to cancer therapy. 4,558,007, Cl. 435-26.000.

Andersson, Leif, to Innova AB. Suturing instrument. 4,557,265, Cl. 128-340.000.

Ando, Akihide: *See*—
Imai, Tetsuya; Toyohara, Kenichi; Goto, Takeshi; Murata, Tadateru; Ando, Akihide; Uchida, Toshiro; and Yamamoto, Izuru, 4,557,750, Cl. 71-87.000.

Ando, Eiji; Goto, Yoshiki; Moriyama, Kumiko; Takeshita, Isao; and Hirao, Kunio, to Matsushita Electric Industrial Company, Limited. Composition for absorption refrigeration. 4,557,850, Cl. 252-68.000.

Andrew Corporation: *See*—
Dyott, Richard B., 4,557,551, Cl. 350-96.150.

Andrews, Peter: *See*—
Hagenmaier, Hans-Paul; Werner, Gerhard; Drautz, Hannelore; Holst, Hartwig; Zahner, Hans; Brandes, Wilhelm; Reinecke, Paul; Zoebelein, Gerhard; Stendel, Wilhelm; Andrews, Peter; and Schaller, Klaus, 4,558,139, Cl. 549-271.000.

Angle, Rodney L., to RCA Corporation. Electrically alterable, nonvolatile floating gate memory device. 4,558,339, Cl. 357-23.500.

ANT Nachrichtentechnik GmbH: *See*—
Geissler, Klaus H.; and Bock, Herbert, 4,558,406, Cl. 363-126.000.

Antonevich, John N., to Simco Company, Inc., The. Ground tether continuity monitor. 4,558,309, Cl. 340-649.000.

Antonov, Dimo P.: *See*—
Atanassov, Lyuben P.; Kohen, Eliezer H.; Maleshkov, Vladimir D.; Antonov, Dimo P.; Russev, Lyubomir S.; and Georgiev, Georgi A., 4,558,408, Cl. 364-130.000.

Aoki, Harumi; Enomoto, Shigeo; Morisawa, Tahei; and Urano, Fumio, to Asahi Kogaku Kogyo Kabushiki Kaisha. Stop control apparatus for electronic camera. 4,558,368, Cl. 358-228.000.

Aoki, Hideji: *See*—
Kida, Susumu; Usami, Hayato; and Aoki, Hideji, 4,558,346, Cl. 357-74.000.

Aoki, Kozo; Ogawa, Akira; and Tanabe, Osami, to Fuji Photo Film Co., Ltd. Silver halide color photographic light-sensitive material. 4,557,999, Cl. 430-385.000.

Aoki, Ryuji: *See*—
Tsuneki, Hideaki; Ueshima, Michio; Aoki, Ryuji; and Nagai, Isao, 4,558,028, Cl. 502-211.000.

Aotsuka, Yasuo; and Yamamoto, Soichiro, to Fuji Photo Film Co., Ltd. Photographic paper material with resin coatings and pigment mixture. 4,558,002, Cl. 430-538.000.

Aoyama, Toshimi; Tohda, Hiroyuki; Kato, Kazuo; and Nakane, Hisashi, to Photopoly Ohka Co., Ltd. Method for providing a patternwise photoresist layer on a substrate plate and a surface-protected substrate plate therefor. 4,557,996, Cl. 430-324.000.

Arai, Akira, to Nihon Ouyou Kougaku Kabushiki Kaisha. Rainbow projector. 4,557,055, Cl. 353-81.000.

Arai, Toyoichi: *See*—
Yamakawa, Masahiro; Nakamura, Mamoru; and Arai, Toyoichi, 4,558,087, Cl. 524-495.000.

Arai, Yoshihiro; and Nahara, Akira, to Fuji Photo Film Company Limited. Process of manufacturing a magnetic recording medium. 4,557,944, Cl. 427-39.000.

Arata, Tetsuya: *See*—
Murayama, Akira; Kuno, Hiroaki; Uchikawa, Naoshi; Tamura, Takahiro; Mizuno, Takao; Kotani, Sumihisa; Tomita, Yoshikatsu; Arata, Tetsuya; Shiibayashi, Masao; and Suefuji, Kazutaka, 4,557,675, Cl. 418-55.000.

Arcamone, Federico: *See*—
Foglio, Maurizio; Franceschi, Giovanni; Scarafile, Cosimo; Arcamone, Federico; and Sanfilippo, Aurora, 4,558,042, Cl. 514-192.000.

Arcuri, Kym B.; Mauldin, Charles H.; and Shaw, Dave H., to Exxon Research and Engineering Co. Ruthenium-rhenium catalyst on titania support for Fischer-Tropsch synthesis. 4,558,030, Cl. 502-325.000.

Ariizumi, Syoji; Fukatsu, Yasushi; and Masuoka, Fujio, to Tokyo Shibaura Denki Kabushiki Kaisha. Semiconductor device having a high resistivity layer in direct contact with a polycrystalline silicon layer of high impurity concentration. 4,558,343, Cl. 357-51.000.

Armco Inc.: *See*—
Boston, Steven L.; Caudill, Forrester; and Arnold, Jerry L., 4,557,953, Cl. 427-432.000.
Cowan, William S., 4,557,628, Cl. 405-191.000.
Mitch, David S.; Abrams, Lloyd W.; Arnold, Jerry L.; Caudill, Forrester; Compton, Thomas A.; and Boston, Steven L., 4,557,952, Cl. 427-432.000.

Armstrong, Thomas R., to Paradyne Corporation. Digital communication link monitoring device. 4,558,317, Cl. 340-825.060.

Arndt, George, to Wynn Oil Company. Lubricant additive concentrate. 4,557,841, Cl. 252-32.70E.

Arnett, Robert D., Jr. Flow sensing speed control for pressure fluid motor. 4,557,674, Cl. 418-15.000.

Arnold, Alanson J. Marine keel cooler. 4,557,319, Cl. 165-44.000.

Arnold, Dieter, to Carl Schenck AG. Method and apparatus for equalizing the density distribution of pressed wood panels. 4,557,882, Cl. 264-40.400.

Arnold, Jerry L.: *See—*
Boston, Steven L.; Caudill, Forrester; and Arnold, Jerry L., 4,557,953, Cl. 427-432.000.
Mitch, David S.; Abrams, Lloyd W.; Arnold, Jerry L.; Caudill, Forrester; Compton, Thomas A.; and Boston, Steven L., 4,557,952, Cl. 427-432.000.

Arnold, Mark G.; and Winkel, Mark D. Computer systems to inhibit unauthorized copying, unauthorized usage, and automated cracking of protected software. 4,558,176, Cl. 178-22.080.

Arnold, Werner: *See—*
Meisner, Alfred; Arnold, Werner; Eggebrecht, Frank; and Grasser, Hans, 4,557,606, Cl. 368-204.000.

Arnoux, Daniel; Haye, Maurice; and Bonneau, Daniel, to Construction D'Appareillage. Shock proof case. 4,557,383, Cl. 206-521.000.

Asada, Takafumi; Onishi, Toshio; Senma, Kajuyoshi; and Matsumoto, Hideo, to Matsushita Electric Industrial Co., Ltd. Dynamic pressure type fluid bearing device. 4,557,610, Cl. 384-107.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Onitsuka, Hatsuki; Saito, Shin; and Fukuda, Hideo, 4,557,830, Cl. 210-198.200.
Yamashita, Izumi; and Toyama, Kunio, 4,558,119, Cl. 528-215.000.
Yoshida, Muneo; and Tamura, Yoshitomo, 4,557,816, Cl. 204-255.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Aoki, Harumi; Enomoto, Shigeo; Morisawa, Tahei; and Urano, Fumio, 4,558,368, Cl. 358-228.000.
Iwanade, Hisao, 4,557,593, Cl. 355-57.000.
Negoro, Ikuo, 4,557,594, Cl. 355-58.000.
Tano, Eiichi; Kobayashi, Takeo; and Negishi, Kiyoshi, 4,557,575, Cl. 354-289.100.
Urata, Shinji; Hirobe, Hitoshi; and Iketani, Kohei, 4,558,367, Cl. 358-227.000.

Asahi-matsu Foods Inc.: *See—*
Kudo, Shiro; and Akaba, Kunihisa, 4,557,936, Cl. 426-104.000.

Asano, Masaru: *See—*
Ishida, Matsuhiko; Asano, Masaru; Goto, Shigeru; and Sakurai, Takeshi, 4,557,369, Cl. 198-333.000.

ASEA Aktiebolag: *See—*
Berg, Arne, 4,557,655, Cl. 414-32.000.
Thoren, Stellan, 4,558,296, Cl. 336-100.000.

Ashland Oil, Inc.: *See—*
Goel, Anil B., 4,558,113, Cl. 528-59.000.
Goel, Anil B., 4,558,114, Cl. 528-73.000.

Askins, William E.: *See—*
Thomas, Gerald A.; and Askins, William E., 4,557,068, Cl. 43-90.000.

Aspinall, Eric L., to Boeing Company, The. Band tensioning device. 4,557,441, Cl. 244-129.400.

Associated Electrical Industries Limited: *See—*
Ainsworth, John D., 4,558,405, Cl. 363-81.000.

AT&T Bell Laboratories: *See—*
Bohannon, William D., Jr.; Collins, Roy P.; Kinard, Michael D.; and Weinraub, William C. L., 4,557,560, Cl. 350-96.230.
Busch-Vishniac, Ilene J.; and Lindenberger, W. Stewart, 4,558,184, Cl. 179-111.00R.
Decker, George A., Jr., 4,557,556, Cl. 350-96.210.
Farquharson, Robert J.; and Gerns, Stanton T., 4,557,411, Cl. 228-56.300.
Fortino, Placido S.; Haas, Laird K. S.; Hong, Siu-Ping; Lo, Wing C.; and Neupauer, Edward J., 4,558,390, Cl. 361-119.000.
Gleason, Robert F.; and McLay, John, 4,557,557, Cl. 350-96.210.
Gordon, Eugene I., 4,558,449, Cl. 372-44.000.
Grosch, James T., 4,558,272, Cl. 323-315.000.
Kim, Suk K.; and Meleis, Hanafy E. S., 4,558,239, Cl. 307-494.000.
Massey, John R., 4,558,174, Cl. 174-92.000.
Massey, Richard P.; and Rowe, Purnell E., 4,558,229, Cl. 307-17.000.
Scordo, Dominick, 4,558,180, Cl. 179-18.0BC.

AT&T Information Systems: *See—*
Farquharson, Robert J.; and Gerns, Stanton T., 4,557,411, Cl. 228-56.300.

AT&T Laboratories: *See—*
Kennedy, James C.; Trimnell, Lawrence J.; and Zola, Meyer J., 4,558,444, Cl. 370-58.000.

AT&T Technologies, Inc.: *See—*
Bohannon, William D., Jr.; Collins, Roy P.; Kinard, Michael D.; and Weinraub, William C. L., 4,557,560, Cl. 350-96.230.
Cushman, Robert H.; and Hoegermeyer, Carl L., 4,557,514, Cl. 294-64.100.
Swanson, Robert R., 4,557,782, Cl. 156-250.000.

Atanassov, Lyuben P.; Kohen, Eliezer H.; Maleshkov, Vladimir D.; Antonov, Dimo P.; Russev, Lyubomir S.; and Georgiev, Georgi A., to Obedineni Zavodi za Zapametyavashti Ustroystva. Manual crate controller. 4,558,408, Cl. 364-130.000.

Atlantic Richfield Company: *See—*
Shum, Wilfred P.; White, John F.; and Beals, Eva M., 4,558,154, Cl. 562-537.000.
Talbert, Sherwood G.; Flanigan, Lawrence J.; Corliss, John M.; Hagopian, John G.; and Nunheimer, Thomas P., 4,557,253, Cl. 126-429.000.

Atobe, Takashi, to Daiwa Seiko, Inc. Level winder for double-bearing reel of fishing rod. 4,557,429, Cl. 242-84.420.

Atochem: *See—*
Brun, Claude; Cheux, Auguste; and Pelletier, Robert, 4,558,023, Cl. 502-108.000.

Audi, Josef: *See—*
Halberschmidt, Friedrich; Audi, Josef; Radermacher, Herbert; and Schwarzenberg, Norbert, 4,557,745, Cl. 65-104.000.

Auer, Jay R., to Corflex International, Inc. Extruded structural system. 4,557,091, Cl. 52-282.000.

Automotive Engine Associates: *See—*
Showalter, Merle R., 4,557,236, Cl. 123-435.000.

Automotive Products plc: *See—*
Nix, Richard A.; and Leigh-Monstevens, Keith V., 4,557,361, Cl. 192-85.00C.

Avdel Limited: *See—*
Jeal, Harvey P., 4,557,649, Cl. 411-40.000.

Avis, Robert P., to Scott Paper Company. Wet-strengthened cellulosic webs. 4,557,801, Cl. 162-157.600.

Azumi, Takashi; Maruyama, Takesuke; and Hisada, Takanori, to Hitachi, Ltd. Lens system with plastic lenses compensating for temperature changes. 4,557,567, Cl. 350-427.000.

B.A.T. Cigaretten-Fabriken GmbH: *See—*
Hesterberg, Eugen, 4,557,101, Cl. 53-50.000.
Weiss, Arno; and Gaisser, Horst, 4,557,057, Cl. 34-48.000.

B. F. Goodrich Company, The: *See—*
Ramp, Floyd L.; and Stiberth, Lothar F., 4,558,086, Cl. 524-399.000.

Baasner, Bernd; and Klauke, Erich, to Bayer Aktiengesellschaft. Process for the preparation of benzal chlorides. 4,558,166, Cl. 570-144.000.

Baatrup, Johannes V., to Danfoss A/S. Tool, particularly a boring tool. 4,557,338, Cl. 173-134.000.

Baba, Fumio; Mochizuki, Hirohiko; and Miyahara, Hatsuo, to Fujitsu Limited. Semiconductor memory device. 4,558,434, Cl. 365-189.000.

Baba, Masatoshi: *See—*
Tanaka, Norio; Taniguchi, Masakazu; Baba, Masatoshi; Ikai, Takashi; Nawamaki, Tsutomu; and Matsunaga, Masaji, 4,557,753, Cl. 71-92.000.

Baba, Toru; and Saito, Yasuo, to Kioritz Corporation. Mowing machine with annular inertia shifter. 4,557,052, Cl. 30-276.000.

Babasade, Wolfgang. Induction smoke regenerator and method for producing natural smoke. 4,558,196, Cl. 219-10.510.

Babcock & Wilcox Company, The: *See—*
Hall, George R., II, 4,557,419, Cl. 236-93.00R.

Bacaner, Marvin B.: *See—*
Broadhurst, John H.; and Bacaner, Marvin B., 4,558,223, Cl. 250-374.000.

Bachmann, Herbert, to Stopinc Aktiengesellschaft. Rotary valve assembly for use in regulating the flow of molten material. 4,557,462, Cl. 251-184.000.

Badesha, Santokh S.; and Fekete, George T., to Xerox Corporation. Process for preparation of chalcogens and chalcogenide alloys of controlled average crystallite size. 4,557,922, Cl. 423-510.000.

Bagnall, Christopher; and McBride, Marvin A., to United States of America, Energy. Weldment for austenitic stainless steel and method. 4,558,202, Cl. 219-137.0WM.

Bailey, Darrell E.: *See—*
Watson, James M.; and Bailey, Darrell E., 4,558,169, Cl. 585-440.000.

Baker Oil Tools, Inc.: *See—*
Stout, Gregg W., 4,557,331, Cl. 166-297.000.

Bakuer Italiana S.p.A.: *See—*
Cioci, Sergio, 4,557,643, Cl. 409-136.000.

Ball, Cyril T.; Tourle, Peter; and Wright, Robert L., to English Electric Valve Company, Limited. Travelling wave tube arrangements. 4,558,257, Cl. 315-5.380.

Ball, David C., to W. W. Sly Manufacturing Co., The. Bulk conveyor apparatus. 4,557,364, Cl. 193-25.00C.

Ball, Randell D. Electric heating apparatus for providing freeze protection for fluid-control devices at well sites. 4,558,206, Cl. 219-301.000.

Bally, Fred R.; and Waldman, Donald J., to Caterpillar Tractor Co. Bypass restrictor for distribution valve. 4,557,237, Cl. 123-450.000.

Balz, Werner: *See—*
Fitterer, Horst; Roos, Roland; Muenzner, Wulf; Balz, Werner; and Berger, Heinz, 4,557,433, Cl. 242-187.000.

Banas, Robert M.; and Kenyon, John W. Hybrid seal with both static and dynamic seal rings. 4,557,487, Cl. 277-12.000.

Banba, Fumiyasu; and Ogata, Mikito, to Hitachi, Ltd. Memory system. 4,558,446, Cl. 371-10.000.

Banba, Toshio: *See—*
Amemori, Koichi; Takahashi, Yosuke; Miyazaki, Manabu; Tsukahara, Hiroaki; Kawabe, Toshihiko; and Banba, Toshio, 4,557,235, Cl. 123-367.000.

Bangay, Alan J.; Cole, Adrian; and Vernon, John S., to BICC Public Ltd., Co. Friction-actuated extrusion. 4,557,894, Cl. 419-67.000.

Bantle, Max: *See—*
Ullmann, Werner; Bantle, Max; Neumann, Harry; Seuser, Ulrich H.; and Mathys, Andre, 4,557,075, Cl. 51-58.000.

Barclay, John L.; Stevens, Geoffrey C.; Stokes, Brian; and Ward, Denis S., to British Petroleum Company Limited, The. Solids transfer system. 4,557,637, Cl. 406-153.000.

Barkis, Edward D.; Moore, Douglas G.; Fernald, Allen M.; and McClellan, Felton L., to Standard Oil Company (Indiana). Non-fraying, breathable fabric suitable for use as a cotton bale cover and bag fabric, apparatus and method for making the same. 4,557,958, Cl. 428-36.000.

Barlow, George J.; Nibby, Chester M., Jr.; and Johnson, Robert B., to Honeywell Information Systems Inc. Pause apparatus for a memory controller with interleaved queuing apparatus. 4,558,429, Cl. 364-900.000.

Barmag Barmer Maschinenfabrik Ag: *See*—
Krenzer, Eberhard, 4,557,689, Cl. 432-59.000.

Baron Enterprises Ltd.: *See*—
Baron, Michael, 4,557,285, Cl. 137-15.000.

Baron, Michael, to Baron Enterprises Ltd. Plugging a cut pipe for soldering a fitting. 4,557,285, Cl. 137-15.000.

Barr & Stroud Limited: *See*—
Neil, Iain A., 4,558,222, Cl. 250-353.000.

Barringer, Eric A.; and Eagar, Thomas W., to Massachusetts Institute of Technology. Non-hygroscopic welding flux binders. 4,557,768, Cl. 148-24.000.

Barron, Earl L. Cable retention clip. 4,557,446, Cl. 248-65.000.

Barth, Bruce P.; and Mallon, Charles B., to Union Carbide Corporation. Coating composition containing polymeric surfactant. 4,558,095, Cl. 525-57.000.

Bartrug, Bruce A.: *See*—
Chabal, Joseph; and Bartrug, Bruce A., 4,557,776, Cl. 156-103.000.

BASF Aktiengesellschaft: *See*—
Berbner, Heinz; Seid, Bernhard; Voelker, Heinz; and Zettler, Hans D., 4,557,969, Cl. 428-283.000.
Bronstert, Klaus; Nickl, Johann; Krause, Hans-Joachim; and Schmitt, Werner, 4,558,104, Cl. 526-65.000.
Deimling, Karl; Falk, Roland; Krug, Aribert; Nagel, Peter; and Sand, Rudolf, 4,557,947, Cl. 427-130.000.
Fitterer, Horst; Roos, Roland; Muenzner, Wulf; Balz, Werner; and Berger, Heinz, 4,557,433, Cl. 242-187.000.
Heil, Guenter; Lenz, Werner; and Kovacs, Jenoe, 4,557,813, Cl. 204-159.140.
Roos, Hans; Schlaefer, Dieter; Boehn, Hugo; Bittler, Knut; and Kilthau, Heinz, 4,557,818, Cl. 204-288.000.
Schupp, Eberhard; Loch, Werner; Osterloh, Rolf; and Ahlers, Klaas, 4,557,814, Cl. 204-181.700.

BASF Farben & Fasern AG: *See*—
Drexler, Hermann-Josef; Ebner, Franz; Hille, Hans-Dieter; and Poth, Ulrich, 4,558,090, Cl. 524-591.000.
Geist, Michael; and Diefenbach, Horst, 4,557,976, Cl. 428-413.000.

Batkin, Joseph M.; Miller, Gary E.; and Wiesner, Wayne, to Boeing Company, The. Wind turbine rotor. 4,557,666, Cl. 416-32.000.

Bass, Robert J., to Pfizer Inc. Method of treating diarrhoea using indole compounds. 4,558,048, Cl. 514-232.000.

Batchelder, Clarence F.; Thomas, Charles E.; and Casady, Kent B., to Clipp Control. Servo amplification system. 4,557,178, Cl. 91-367.000.

Battelle Development Corporation: *See*—
Preston, Joseph R.; and Hillenbrand, Louis J., 4,557,807, Cl. 204-4.000.
Rodgers, Stephen D.; Dick, Richard J.; and McGinnis, Vincent D., 4,557,870, Cl. 260-404.800.

Bauer, John F.; and Shada, Douglas M., to Abbott Laboratories. Acid salts of valproic acid. 4,558,070, Cl. 514-557.000.

Bauman, Jack. Examination device with an improved blade connection. 4,557,256, Cl. 128-11.000.

Bauman, Jack: *See*—
Wallace, Robert S., 4,556,996, Cl. 623-2.000.

Baumann, Marcus: *See*—
Wenk, Paul; Breitenstein, Werner; and Baumann, Marcus, 4,558,043, Cl. 514-210.000.

Baumgarten, Gerd D., to Heinrich Baumgarten KG Eisen- und Blechwarenfabrik. Lid button with a controllable steam outlet. 4,557,396, Cl. 220-206.000.

Baumgartner, Gary J.; Walter, Carl E.; and Post, Arthur J., Jr., to Triten Corporation. Coke cooler. 4,557,804, Cl. 202-227.000.

Bauridl, Karl A. Heating apparatus for packaged foodstuff. 4,558,203, Cl. 219-214.000.

Bawks, James R.: *See*—
Dissett, Walter L.; and Bawks, James R., 4,557,158, Cl. 74-650.000.

Bayer Aktiengesellschaft: *See*—
Bassner, Bernd; and Klauke, Erich, 4,558,166, Cl. 570-144.000.
Beecken, Hermann, 4,558,133, Cl. 546-329.000.
Hagenmaier, Hans-Paul; Werner, Gerhard; Drautz, Hannelore; Holst, Hartwig; Zahner, Hans; Brandes, Wilhelm; Reinecke, Paul; Zoebelein, Gerhard; Stendel, Wilhelm; Andrews, Peter; and Schaller, Klaus, 4,558,139, Cl. 549-271.000.
Seidel, Wolfgang; Kazda, Stanislav; and Knorr, Andreas, 4,558,055, Cl. 514-291.000.

BBC Brown, Boveri & Company, Limited: *See*—
Mayer, Andreas; and Stussi, Rudolf, 4,557,226, Cl. 123-41.860.

Beals, Eva M.: *See*—
Shum, Wilfred P.; White, John F.; and Beals, Eva M., 4,558,154, Cl. 562-537.000.

Beals, Penny L.; Simon, Phyllis M.; and Campbell, Bruce D., to Raychem Corporation. Optical fiber taps. 4,557,550, Cl. 350-96.150.

Bearden, Roby, Jr.; and Aldridge, Clyde L., to Exxon Research and Engineering Co. Hydroconversion process. 4,557,822, Cl. 208-112.000.

Beaver, Richard N.; Evans, Kenneth R.; and Waters, Donald D., to Dow Chemical Company, The. Bonded asbestos diaphragms. 4,557,810, Cl. 204-98.000.

Bechis, Dennis J.; Chen, Hsing-Yao; and Hughes, Richard H., to RCA Corporation. Color picture tube having an inline electron gun with asymmetric focusing lens. 4,558,253, Cl. 313-414.000.

Beck, Blaine E.: *See*—
Corris, C. James; and Beck, Blaine E., 4,558,177, Cl. 179-2.0EA.
Corris, C. James; and Beck, Blaine E., 4,558,183, Cl. 179-84.00A.

Beck, Harold K., to Halliburton Company. Low pressure responsive downhole tool with cam actuated relief valve. 4,557,333, Cl. 166-374.000.

Beck, Jeffrey L.; and El-Saie, Ahmed A., to Conoco Inc. Injection of solids into a high pressure slurry stream. 4,557,636, Cl. 406-19.000.

Becker, Reinhard: *See*—
Teetz, Volker; Urbach, Hansjorg; and Becker, Reinhard, 4,558,064, Cl. 514-409.000.
Urbach, Hansjorg; Henning, Rainer; and Becker, Reinhard, 4,558,065, Cl. 514-412.000.

Beecham Group p.l.c.: *See*—
Beeley, Lee J.; and Newsome, Peter M., 4,558,063, Cl. 514-402.000.
King, Francis D., 4,558,044, Cl. 514-222.000.

Beecken, Hermann, to Bayer Aktiengesellschaft. p-(Pyridinium-vinyl)-N,N-(disubstituted-aniline salts for dyeing paper and their preparation. 4,558,133, Cl. 546-329.000.

Beeley, Lee J.; and Newsome, Peter M., to Beecham Group p.l.c. Treatment of diarrhoea with 2-aminoimidazoline derivatives. 4,558,063, Cl. 514-402.000.

Beerens, Cornelis J. M. Chain saw bar. 4,557,054, Cl. 30-384.000.

Beier, Heinz: *See*—
Vaubel, Gert; and Beier, Heinz, 4,557,315, Cl. 164-420.000.

Beliveau, Jean L., to EPSM Inc. Insulated building block. 4,557,093, Cl. 52-405.000.

Beliveau, Jean L., to EPSM Inc. Insulated block building. 4,557,094, Cl. 52-405.000.

Bellows, Kenneth O., to Air Preheater Company, Inc., The. Means for lifting heating element baskets. 4,557,318, Cl. 165-10.000.

Belmont, Lee. Vacuum coupled squeegee attachment. 4,557,013, Cl. 15-401.000.

Belmonte, James A.; and Hillman, Arthur E., to Corning Glass Works. Masking apparatus for selectively charging honeycomb structures. 4,557,962, Cl. 428-117.000.

Benard, David J.: *See*—
McDermott, William E.; Ellis, David E.; Pchelkin, Nicholas R.; Miller, George W.; Benard, David J.; and Richardson, Ralph J., 4,558,451, Cl. 372-89.000.

Bencz, Gyozo ; Deres, Janos; and Tuti, Peter, to Orszagos Koolaj es Gazipari Troszt; and Es Robbanoanyag Felugyelet. Charge liner for hollow explosive charges. 4,557,771, Cl. 149-14.000.

Benjamin, Benjamin C., to Schmelzer Corporation. Releasable and adjustable securing device. 4,557,455, Cl. 248-496.000.

Benjamin, James A.: *See*—
Schutten, Herman P.; Benjamin, James A.; and Lade, Robert W., 4,558,243, Cl. 307-584.000.

Bennes Marrel: *See*—
Chanal, Roger; and Cotte, Daniel, 4,557,290, Cl. 137-510.000.

Bennett, Brian; and Clough, Donald K., to Sandoz Ltd. Solutions of U.V. absorbers useful for improving the light fastness of dyeings on polyester. 4,557,730, Cl. 8-442.000.

Bennison, John J.: *See*—
Brocklebank, Philip; and Bennison, John J., 4,557,896, Cl. 422-14.000.

Benson, Arthur: *See*—
Levendusky, Thomas L.; and Benson, Arthur, 4,558,198, Cl. 219-10.55E.

Benteler-Werke Aktiengesellschaft: *See*—
Vaubel, Gert; and Beier, Heinz, 4,557,315, Cl. 164-420.000.

Berbner, Heinz; Seid, Bernhard; Voelker, Heinz; and Zettler, Hans D., to BASF Aktiengesellschaft. Sheet-like packing material of melamine or phenol resin fibers. 4,557,969, Cl. 428-283.000.

Berg, Arne, to ASEA Aktiebolag. Delivery of articles to and from a mechanical treating machine served by an industrial robot. 4,557,655, Cl. 414-32.000.

Bergen, Richard F.: *See*—
Gundlach, Robert W.; and Bergen, Richard F., 4,558,221, Cl. 250-325.000.

Berger, Gunther; and Frech, Alfred, to Robert Bosch GmbH. Cutter block for a motor driven hand planer. 4,557,305, Cl. 144-230.000.

Berger, Heinz: *See*—
Fitterer, Horst; Roos, Roland; Muenzner, Wulf; Balz, Werner; and Berger, Heinz, 4,557,433, Cl. 242-187.000.

Bergfeld, Manfred: *See*—
Zengel, Hans-Georg; Bergfeld, Manfred; and Eisenhuth, Ludwig, 4,558,135, Cl. 548-158.000.

Berggren, Benny; and Gripenholt, Ninneh, to Q & Q Retreading System AB. Tie-gum layer for retreading vehicle tires. 4,557,775, Cl. 156-96.000.

Berglund, Lennart H. A.: *See*—
Lagerstrom, Gosta B.; and Berglund, Lennart H. A., 4,557,918, Cl. 423-335.000.

Bergmann, Erich, to ETA S.A., Fabriques d'Ebauches. Article comprising a substrate having a hard and corrosion-proof coating thereon. 4,557,981, Cl. 428-627.000.

Bergmans, Hendrik J., to U.S. Philips Corporation. High speed scanning arrangement for video tape recorder. 4,558,381, Cl. 360-77.000.

Bernard, Jean; Beyl, Jean; Briee, Serge; and le Faou, Daniel, to Ste LOOK. Rear element for a ski binding. 4,557,499, Cl. 280-626.000.

Bernardi, Luigi; Lazzari, Ettore; Malnati, Maria L.; Mazzini, Giuseppe; Pegrassi, Lorenzo; and Rossi, Alessandro, to Farmitalia Carlo Erba S.p.A. Antipsycotic benzoxazines. 4,558,049, Cl. 514-234.000.

Bernareggi, Virgilio; Bonifacio, Fausto; Margutti, Roberto; and Fano, Maurizio, to Valeas S.p.A. Spasmolytic endo-8,8-dialkyl-8-azoniabicyclo (3.2.1) octane-6,7-exo-epoxy-3-alkyl-carboxylate salts. 4,558,054, Cl. 514-291.000.

Bernhardson, Gary E. Cross country ski binding. 4,557,498, Cl. 280-615.000.

Bernstein, Kerry, to International Business Machines Corporation. Multi-port register implementations. 4,558,433, Cl. 365-189.000.

Berson, Leo A.: *See*—
Bird, Richard G.; and Berson, Leo A., 4,557,149, Cl. 73-862.540.
Berstein, Patrick, to Imperial Oil Limited. Transaction terminal system. 4,558,211, Cl. 235-380.000.
Berthet, Jeanne; Blin, Marie-Francoise; Gaussens, Gilbert; and Noaillac, Jean R., to Commissariat a l'Energie Atomique. Conditioning device for hydrosoluble fertilizers and/or other products. 4,557,749, Cl. 71-64.110.
Bertin & Cie: *See*—
Collard, Maurice; and De Goncourt, Louis, 4,557,500, Cl. 280-669.000.
Bertschinger, Hans: *See*—
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Besson, Rene ; and Guerin, Yves, to ETA S.A., Fabriques d'Ebauches. Control device for two bidirectional step motors. 4,558,268, Cl. 318-696.000.
Best, Steven A., to Exxon Research & Engineering Co. Polymerization catalyst, production and use. 4,558,024, Cl. 502-115.000.
Best, Steven A., to Exxon Research & Engineering Co. Polymerization catalyst, production and use. 4,558,025, Cl. 502-115.000.
Beyl, Jean: *See*—
Bernard, Jean; Beyl, Jean; Briee, Serge; and le Faou, Daniel, 4,557,499, Cl. 280-626.000.
Bezard, Jean-Jacques; Jourdain, Charles H.; and Lalanne, Bruno, to JAEGER. Apparatus for monitoring the level of liquid in a tank or reservoir. 4,558,456, Cl. 377-25.000.
Bhagwan, Jai: *See*—
Trofimenkoff, Frederick N.; Bhagwan, Jai; and Poscente, Sandro P., 4,558,301, Cl. 340-347.0AD.
BICC Public Ltd., Co.: *See*—
Bangay, Alan J.; Cole, Adrian; and Vernon, John S., 4,557,894, Cl. 419-67.000.
Biek, Paul A., to Dresser Industries, Inc. Dwell and depth attachment. 4,557,646, Cl. 409-218.000.
Biemans, Arnoldus. Needle threading devices. 4,557,408, Cl. 223-99.000.
Bieri, Hans, to Hydrostress AG. Concrete cutting or milling apparatus including a guide rail. 4,557,245, Cl. 125-14.000.
Billi, Roberto; and Copperi, Maurizio, to CSELT - Centro Studi e Laboratori Telecomunicazioni S.p.A. Digital echo-cancellation method and circuit arrangement. 4,558,187, Cl. 179-170.200.
Binggeli, Bruno K.: *See*—
Kiess, Helmut G.; Binggeli, Bruno K.; and Derendinger, Max, 4,557,885, Cl. 264-105.000.
Kiess, Helmut G.; Binggeli, Bruno K.; and Derendinger, Max, 4,557,886, Cl. 264-105.000.
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af Ekenstam, Bo T.; Glantz, Per-Olof; and Larsson, Kare, 4,557,935, Cl. 424-130.000.
Bioresearch S.P.A.: *See*—
Gennari, Federico, 4,558,122, Cl. 536-26.000.
Birch, Charles H. Method for underground burning of coal for energy. 4,557,328, Cl. 166-256.000.
Bird, Richard G.; and Berson, Leo A., to United States of America, National Aeronautics & Space Administration. Portable 90 degree proof loading device. 4,557,149, Cl. 73-862.540.
Birkholz, Roger O.: *See*—
Comeau, Leon J.; and Birkholz, Roger O., 4,558,276, Cl. 324-117.00H.
Bisco Products, Inc.: *See*—
Montana, Frank J., 4,557,297, Cl. 138-141.000.
Bittler, Dieter: *See*—
Wiechert, Rudolf; Bittler, Dieter; Schleusener, Annerose; and Albring, Manfred, 4,558,041, Cl. 514-178.000.
Bittler, Knut: *See*—
Roos, Hans; Schlaefer, Dieter; Boehn, Hugo; Bittler, Knut; and Kilthau, Heinz, 4,557,818, Cl. 204-288.000.
Black & Decker Inc.: *See*—
Dibbern, John E., Jr.; and Moores, Gregory E., 4,558,189, Cl. 200-1.00V.
Black, Donald E.; Sweany, Louis P.; and Pirtle, James D., to Emhart Industries, Inc. Multiple tone signaling device. 4,558,305, Cl. 340-384.00E.
Black, Robert A., Jr.; Clark, Rodney L.; Kidder, Kenneth B.; and Patton, Paul B., to Honeywell Inc. Control logic safety monitoring circuit means. 4,558,389, Cl. 361-88.000.
Blais, Phillip D., to Westinghouse Electric Corp. High resolution lithographic process. 4,557,986, Cl. 430-22.000.
Blanc, Ernst, to Richard Wolf GmbH. Light projectors. 4,557,554, Cl. 350-96.200.
Blanchard, Kenneth E.; and Sanislo, Stephen V., Jr., to Phonetics, Inc. Portable device for monitoring local area. 4,558,181, Cl. 179-5.00P.
Blanding, Wendell S.; Johnson, Ronald E.; and Van Dewoestine, Robert V., to Corning Glass Works. Television tube with optional shadow mask and method of manufacture. 4,557,798, Cl. 156-660.000.
Blasius, Udo: *See*—
Rodi, Anton; Blasius, Udo; and Uhrig, Dieter, 4,558,216, Cl. 250-223.00R.
Blattner, John D.: *See*—
DenBeste, Steven C.; Boyce, Douglas G.; Blattner, John D.; and Hillen, Kenneth K., 4,558,422, Cl. 364-480.000.
Bleck, Norris E.: *See*—
Meeker, Gregory W.; and Bleck, Norris E., 4,557,683, Cl. 425-147.000.
Bleckmann, Ingo. Electric continuous flow water heater assembly for a beverage making machine. 4,558,204, Cl. 219-283.000.
Bleckmann, Ingo. Electric continuous flow water heater having dual temperature safety limiting devices. 4,558,205, Cl. 219-283.000.
Blin, Marie-Francoise: *See*—
Berthet, Jeanne; Blin, Marie-Francoise; Gaussens, Gilbert; and Noaillac, Jean R., 4,557,749, Cl. 71-64.110.
Blinov, Konstantin A.: *See*—
Mizin, Vladimir G.; Zubarev, Alexei G.; Kolganov, Gennady S.; Volkov, Stanislav S.; Rudnev, Jury A.; Ivashina, Evgeny N.; Blinov, Konstantin A.; and Jugov, Petr I., 4,557,758, Cl. 75-51.200.
Bloch, Ricardo: *See*—
Gutierrez, Antonio; Brownawell, Darrell W.; and Bloch, Ricardo, 4,557,847, Cl. 252-51.50A.
Block, Myron J.: *See*—
Hirschfeld, Tomas B.; and Block, Myron J., 4,558,014, Cl. 436-527.000.
Bloom, Daniel H. Pressed number pocket. 4,557,063, Cl. 40-5.000.
Bock, Herbert: *See*—
Geissler, Klaus H.; and Bock, Herbert, 4,558,406, Cl. 363-126.000.
Bode, Robert H., to Cambridge Wire Cloth Company, The. Modular conveyor belting with cam-slotted links for maintaining transverse distribution of tension while negotiating horizontal curves and for facilitating cleaning. 4,557,374, Cl. 198-852.000.
Boeck, LaVerne D.; Marconi, Gary G.; and Hoehn, Marvin M., to Eli Lilly and Company. Process for production of A-51568B antibiotic. 4,558,008, Cl. 435-75.000.
Boeck, LaVerne D.; Hoehn, Marvin M.; and Marconi, Gary G., to Eli Lilly and Company. Process for producing antibiotic A-51568 by fermentation and microorganism. 4,558,009, Cl. 435-75.000.
Boehn, Hugo: *See*—
Roos, Hans; Schlaefer, Dieter; Boehn, Hugo; Bittler, Knut; and Kilthau, Heinz, 4,557,818, Cl. 204-288.000.
Boehringer Ingelheim KG: *See*—
Mentrup, Anton; Schromm, Kurt; Renth, Ernst-Otto; Muacevic, Gojko; and Fugner, Armin, 4,558,061, Cl. 514-392.000.
Boehringer Mannheim Corporation: *See*—
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Boehringer Mannheim GmbH: *See*—
Klose, Sigmar; Pasch, Manfred; Kleemann, Wolfgang; Vieth, Friedhelm; and Buschek, Herbert, 4,557,600, Cl. 356-246.000.
Boeing Company, The: *See*—
Adams, Ronald, 4,557,440, Cl. 244-129.400.
Aspinall, Eric L., 4,557,441, Cl. 244-129.400.
Baskin, Joseph M.; Miller, Gary E.; and Wiesner, Wayne, 4,557,666, Cl. 416-32.000.
Ferrieri, John, 4,557,513, Cl. 294-1.100.
Gorges, Friedrich J., 4,557,100, Cl. 52-787.000.
Gorges, Friedrich J., 4,557,961, Cl. 428-117.000.
Hodge, John G., 4,557,401, Cl. 222-211.000.
Krezak, John E.; and Lamb, Michael F., 4,557,442, Cl. 244-137.00P.
Lundberg, Gary W., 4,557,465, Cl. 254-287.000.
Tanner, John G., 4,557,163, Cl. 81-9.440.
Bogaczyk, Stanley H. Pants hanger. 4,557,407, Cl. 223-96.000.
Bogard, Edward L., to Geosource Inc. Well tool locking apparatus. 4,557,326, Cl. 166 212.000.
Bogdanov, Gennady N.: *See*—
Emanuel, Nikolai M.; Rozenberg, Albina N.; Golubev, Valery A.; Bogdanov, Gennady N.; Vasilieva, Ljubov S.; and Konovalova, Nina P., 4,558,127, Cl. 544-310.000.
Bohannon, William D., Jr.; Collins, Roy P.; Kinard, Michael D.; and Weinraub, William C. I., to AT&T Technologies, Inc.; and AT&T Bell Laboratories. Rodent and lightning protective sheath system for cables. 4,557,560, Cl. 350-96.230.
Bohn, Helmut: *See*—
Schonafinger, Karl; Bohn, Helmut; Just, Melitta; and Martorana, Piero, 4,558,058, Cl. 514-342.000.
Bohnenberger, Willy: *See*—
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Boik, Elmer, to Continental White Cap, Inc. Snap-on cap with tethering strap. 4,557,393, Cl. 215-253.000.
Boise Cascade Corporation: *See*—
Ford, James A.; Staack, Gerald F.; and Waite, Phillip, 4,557,414, Cl. 229-5.500.
Bolduc, Richard M.; and Lagarde, Paul R., to Bolduc, Richard M. Aerodynamic illuminated sign. 4,557,517, Cl. 296-1.00S.
Bolger, Thomas V.; and Libbey, Robert L., to RCA Corporation. Digital video signal processing system using asynchronous a-to-d encoding. 4,558,348, Cl. 358-13.000.
Boliden Aktiebolag: *See*—
Lagerstrom, Gosta B.; and Berglund, Lennart H. A., 4,557,918, Cl. 423-335.000.
Bolinsky, Henry E.; and Klovensky, Edward J., to RCA Corporation. Method of verifying the operability of sockets in a kinescope aging line. 4,557,699, Cl. 445-3.000.
Bolser, David R.: *See*—
Lewis, Wallace J.; and Bolser, David R., 4,557,413, Cl. 228-183.000.
Bond, Harry L. F., to Davy McKee (Sheffield) Limited. Housingless beam mill stand. 4,557,130, Cl. 72-225.000.
Bond, Raymond G., to T.A.D. Avanti, Inc. Message playback control system for telephone answering machine. 4,558,179, Cl. 179-6.030.
Bonhard, Robert B. Power cord storage and dispenser. 4,557,430, Cl. 242-96.000.

Bonifacio, Fausto: *See*—
Bernareggi, Virgilio; Bonifacio, Fausto; Margutti, Roberto; and Fano, Maurizio, 4,558,054, Cl. 514-291.000.

Bonneau, Daniel: *See*—
Arnoux, Daniel; Haye, Maurice; and Bonneau, Daniel, 4,557,383, Cl. 206-521.000.

Bonzo, Roy T., to Corning Glass Works. Method for selectively manifolding honeycomb structures. 4,557,773, Cl. 156-64.000.

Boon, Wyndham H.; and Henderson, James N., to Goodyear Tire & Rubber Company, The. High performance rubber-polyester blends. 4,558,096, Cl. 525-166.000.

Booth, Brian: *See*—
Fenton, Frank A.; Booth, Brian; Jones, Stanley P.; and Gennard, Derek, 4,557,744, Cl. 65-29.000.

Booz, George W.: *See*—
Thornton, Peter B.; Cone, Stanley H.; and Booz, George W., 4,557,968, Cl. 428-229.000.

Borg-Warner Chemicals, Inc.: *See*—
Albertson, Clarence E., 4,557,809, Cl. 204-59.0QM.

Borg-Warner Corporation: *See*—
Wentworth, Robert S., 4,557,489, Cl. 277-65.000.

Borowy, Dennis M.; Crotty, Charles A.; Perrins, Allen R.; and Senak, Peter, Jr., to Superior Electric Company, The. Line voltage monitor system. 4,558,275, Cl. 324-103.00P.

Boschi, Alide, to Vitro Tec Fideicomiso. Multiple-drop feeding system of molten glass and of other materials. 4,557,747, Cl. 65-328.000.

Boschung, Marcel; and Zehnder, Walter, to Boschung Mecatronic AG. Electromagnetically controllable spray valve and spray system. 4,557,420, Cl. 239-66.000.

Boschung Mecatronic AG: *See*—
Boschung, Marcel; and Zehnder, Walter, 4,557,420, Cl. 239-66.000.

Boston, Steven L.; Caudill, Forrester; and Arnold, Jerry L., to Armco Inc. Process for controlling snout zinc vapor in a hot dip zinc based coating on a ferrous base metal strip. 4,557,953, Cl. 427-432.000.

Boston, Steven L.: *See*—
Mitch, David S.; Abrams, Lloyd W.; Arnold, Jerry L.; Caudill, Forrester; Compton, Thomas A.; and Boston, Steven L., 4,557,952, Cl. 427-432.000.

Botnick, Irlin H., to Josam Developments, Inc. Closure-assisted cartridge-type flow control valve. 4,557,288, Cl. 137-315.000.

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Cook, John, 4,558,153, Cl. 560-247.000.

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Callewaert, Denis M.; and Braxton, Earl J., 4,557,863, Cl. 260-112.00R.

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Break, Douglas G., to Tapco Products Company, Inc. Sheet bending brake. 4,557,132, Cl. 72-319.000.

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Bresser, Onno R., to N.K.F. Groep B.V. Optical cable element. 4,557,558, Cl. 350-96.230.

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Merten, Gerhard; Breuer, Oswald; Hesse, Norbert; and Steinkuhl, Bernd, 4,557,525, Cl. 299-93.000.

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Brill, Jurgen, to Schaudt Maschinenbau GmbH. Method of dressing and finishing grinding wheels. 4,557,078, Cl. 51-325.000.

Brill, William F., to Halcon SD Group, Inc., The. Catalyst comprising tellurium chemically bound to aromatic polymer. 4,558,026, Cl. 502-159.000.

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Tysoe, Nicholas W., 4,558,401, Cl. 362-290.000.
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Shrestha, Mukunda B.; and Mendenhall, Geoffrey N., 4,558,285, Cl. 330-53.000.

Broadhurst, John H.; and Bacaner, Marvin B., to Sysmed, Inc. Electronic x-ray recording. 4,558,223, Cl. 250-374.000.

Brocklebank, Philip; and Bennison, John J., to Dearborn Chemicals Limited. Treatment of aqueous systems. 4,557,896, Cl. 422-14.000.

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Gravely, Lawrence E.; Geiss, Vernon L.; and Gregory, Charles F., 4,557,280, Cl. 131-297.000.
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Brownawell, Darrell W.: *See*—
Chen, Frank J.; and Brownawell, Darrell W., 4,558,170, Cl. 585-532.000.
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Brueske, Ralph H., to Butler Manufacturing Company. Safety reinforced roof insulation. 4,557,092, Cl. 52-404.000.

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Jannemann, Theo; and Brunje, Horst, 4,557,220, Cl. 122-20.00B.

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Neisen, Gerald F., 4,557,695, Cl. 440-53.000.

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Buchanan, Jerry C.: *See*—
Kamel, Mostafa M.; Wells, Larry D.; and Buchanan, Jerry C., 4,557,221, Cl. 123-1.00A.

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Buckley, Bruce S.; Buckley, Edward M.; and Reichwein, Roy H., to Cochlea Corporation. System to measure geometric and electromagnetic characteristics of objects. 4,557,386, Cl. 209-556.000.
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Buffalo Dental Mfg., Co., Inc.: *See*—
Dulski, John; and Klobas, John, 4,557,314, Cl. 164-287.000.
Buffington, Ralph M.; Kaminski, Perry; and Larson, Eugene A., to Technicare Corporation. Selectable focus ultrasonic transducers for diagnostic imaging. 4,557,146, Cl. 73-642.000.
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Fasciati, Alfred; and Buhler, Arthur, 4,558,121, Cl. 534-641.000.
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Bunz, Lewis A.: *See*—
Schachter, Rozalie; Viscogliosi, Marcello; and Bunz, Lewis A., 4,558,340, Cl. 357-23.700.
Burgeth, Heinz; Leitner, Georg; and Wolf, Joachim, to Telefunken Electronic GmbH. Button switch device. 4,558,191, Cl. 200-5.00A.
Burgi, Sigi: *See*—
Zust, Harry; and Burgi, Sigi, 4,557,539, Cl. 339-17.00C.
Burkhardt, Helmut. Solar water boiling device. 4,557,251, Cl. 126-417.000.
Burkhart, Scott C. Skimming device for swimming pool. 4,557,001, Cl. 4-490.000.
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Faber, Ulbe; Davis, Robert L.; Fisher, David A.; and McGonagle, Joseph D., 4,558,411, Cl. 364-200.000.
Burrows, James L., to Sanders Associates, Inc. Universal logic circuit. 4,558,236, Cl. 307-465.000.
Burzynski, Stanislaw R. Purified antineoplaston fractions and methods of treating neoplastic disease. 4,558,057, Cl. 514-328.000.
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Caignard, Daniel H.; Lespagnol, Charles; Lesieur, Daniel; and Busch, Norbert, 4,558,060, Cl. 514-375.000.
Busch-Vishniac, Ilene J.; and Lindenberger, W. Stewart, to AT&T Bell Laboratories. Integrated capacitive transducer. 4,558,184, Cl. 179-111.00R.
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Busse, Gerhard, to Carl-Zeiss-Stiftung, Heidenheim/Brenz. Method and device for structural, superficial and deep analysis of a body. 4,557,607, Cl. 374-121.000.
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Brueske, Ralph H., 4,557,092, Cl. 52-404.000.
Thurnau, Vernon L.; and Mariano, Arturo, 4,557,098, Cl. 52-712.000.
Byrne, Thomas E. Meter tube insert and adapter ring. 4,557,296, Cl. 138-44.000.
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Test, Dan, 4,558,193, Cl. 200-43.050.
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Cheney, Joseph J., 4,557,177, Cl. 89-1.510.
Cabanaw, Boyd E.: *See*—
Goddin, Clifton S., Jr.; and Cabanaw, Boyd E., 4,557,911, Cl. 423-228.000.
Cahan, Leslie D.: *See*—
Irie, Reiko F.; Tai, Tadashi; Morton, Donald L.; Cahan, Leslie D.; and Paulson, James C., 4,557,931, Cl. 424-88.000.
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Caines, R. Scott, to American Hoechst Corporation. Tamper-resistant polyester credit cards. 4,557,963, Cl. 428-156.000.
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Calgon Carbon Corporation: *See*—
Farmerie, John J., 4,558,022, Cl. 502-25.000.
Callaghan, Ian C.; Fink, Hans-Ferdi; Gould, Clive M.; Koerner, Gotz; Patzke, Hans-Jurgen; and Weitemeyer, Christian, to British Petroleum Company p.l.c, The. Oil gas separation. 4,557,737, Cl. 55-87.000.
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Genest, Leonard J.; and Calvagna, J. Francis, 4,558,175, Cl. 178-22.080.
Cambridge Wire Cloth Company, The: *See*—
Bode, Robert H., 4,557,374, Cl. 198-852.000.
Cameron, Ewen R.: *See*—
Mansfield, Graham J.; Hall, Dennis S.; and Cameron, Ewen R., 4,557,787, Cl. 156-356.000.
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Walker, Stephen J., 4,557,508, Cl. 285-84.000.
Campbell, Bruce D.: *See*—
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Campbell, J. Allan, to Upjohn Company, The. 11β-Difluoromethyl and (E)- and (Z)-11-fluoromethylene steriods. 4,557,867, Cl. 260-239.500.
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Hampson, Alfred A., 4,558,212, Cl. 235-383.000.
Canada, Her Majesty the Queen in right of Canada, as represented by the Minister of Energy, Mines and Resources of: *See*—
Ternan, Marten; and Parsons, Basil I., 4,558,031, Cl. 502-355.000.
Canadian Liquid Air Ltd./Air Liquide Canada LTEE: *See*—
Savard, Guy; and Lee, Robert G. H., 4,557,329, Cl. 166-261.000.
Cannata, Vincenzo; and Tamagnone, Gian F., to ALFA Farmaceutici S.p.a. Process for the synthesis of pyrido-imidazo rifamycins. 4,557,866, Cl. 260-239.30P.
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Edakubo, Hiroo; Takayama, Nobutoshi; and Takimoto, Hiroyuki, 4,558,382, Cl. 360-77.000.
Kan, Fumitaka; and Nakahata, Kimio, 4,557,582, Cl. 355-3.0DD.
Kobayashi, Masatsune; Eida, Tsuyoshi; Koike, Shoji; Yokoyama, Yasumasa; and Komori, Tomoko, 4,557,761, Cl. 106-22.000.
Komiya, Yutaka; Murakami, Katsumi; Inuzuka, Tsuneki; and Sakamaki, Hisashi, 4,557,587, Cl. 355-14.00C.
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Saito, Tetsuro, 4,558,190, Cl. 200-5.00A.
Shinoda, Nobuhiko, 4,557,577, Cl. 354-400.000.
Shirai, Shigeru; Kanbe, Junichiro; and Fukuda, Tadaji, 4,557,987, Cl. 430-58.000.
Sugitani, Hiroshi; Matsuda, Hiroto; and Ikeda, Masami, 4,558,333, Cl. 346-140.00R.
Suzuki, Takashi, 4,557,580, Cl. 354-406.000.
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Toda, Katsuhiko; and Sugiura, Susumu, 4,558,356, Cl. 358-75.000.
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Tomosada, Masahiro, 4,557,588, Cl. 355-14.00R.
Cantwell, Thomas; Simon, William; and Young, Bobby, to Loomis International Inc. Leak detection method and apparatus. 4,557,139, Cl. 73-40.700.
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Longenderfer, John E.; Luchaco, David G.; and Capewell, Dennis, 4,558,262, Cl. 315-307.000.
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Heitzmann, Harold A., 4,557,900, Cl. 422-55.000.
Carl Schenck AG.: *See*—
Arnold, Dieter, 4,557,882, Cl. 264-40.400.
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Busse, Gerhard, 4,557,607, Cl. 374-121.000.
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Carr, William H., Jr.; and Desmond, John D., to Container Corporation of America. Ice cream carton. 4,557,415, Cl. 229-30.000.
Carrick, Wayne L.; Solvik, R. Sven; and Kirch, William, to Chemplex Company. Copolymerization of ethylene. 4,558,105, Cl. 526-68.000.
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Freliech, Robert A., 4,558,306, Cl. 340-520.000.
Carusillo, Steven J., to Johnson Service Company. Apparatus and method determining the value of a capacitance. 4,558,274, Cl. 324-60.0CD.
Carver, Michael J., to United States of America, Navy. Thermal microstructure measurement system. 4,557,608, Cl. 374-170.000.
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Batchelder, Clarence F.; Thomas, Charles E.; and Casady, Kent B., 4,557,178, Cl. 91-367.000.
Cash, L. Dale: *See*—
Nash, Ronald S.; and Cash, L. Dale, 4,557,021, Cl. 19-80.00R.
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Schonafinger, Karl; Bohn, Helmut; Just, Melitta; and Martorana, Piero, 4,558,058, Cl. 514-342.000.
Castellaw, Gerald J.; Wigham, Ronald C.; and Ames, Edwin N. Movable sun shade system. 4,557,310, Cl. 160-84.00R.
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Bally, Fred R.; and Waldman, Donald J., 4,557,237, Cl. 123-450.000.
Golan, Kenneth F., 4,557,363, Cl. 192-113.00B.
Oestmann, Eldon D., 4,557,157, Cl. 74-607.000.
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Cattaneo, Giuseppe. Horseshoe lining. 4,557,334, Cl. 168-12.000.
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Cawood, Charles D. Midstream urine collector. 4,557,274, Cl. 128-760.000.

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Corris, C. James; and Beck, Blaine E., 4,558,177, Cl. 179-2.0EA.
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Delassus, Jean; and Pierrat, Lambert, 4,557,667, Cl. 417-50.000.

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Tsukuda, Hitoshi; and Sakanoue, Akira, 4,557,974, Cl. 428-407.000.

Chabal, Joseph; and Bartrug, Bruce A., to PPG Industries, Inc. Prepressing glass plastic assemblies. 4,557,776, Cl. 156-103.000.

Chalmers, Wallace G. Adjustable torque rod. 4,557,622, Cl. 403-388.000.

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Heyne, John A.; and Chamness, Leland D., 4,557,725, Cl. 604-67.000.

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Bower, Richard K.; and Tellman, Stephen J., 4,557,779, Cl. 156-219.000.

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Fields, Gerald S., 4,557,829, Cl. 210-132.000.

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Chan, Chi-Chung; and Ford-Hutchinson, Anthony W., to Merck & Co., Inc. Cardiovascular composition. 4,558,037, Cl. 514-20.000.

Chan, Patrick S.: *See*—
Ward, Joseph W.; Povio, Raymond A.; Schroeder, Russell G.; and Chan, Patrick S., 4,558,391, Cl. 361-155.000.

Chanal, Roger; and Cotte, Daniel, to Bennes Marrel. Hydraulic slide control safety valve for a mine support jack. 4,557,290, Cl. 137-510.000.

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Thompson, Kathryn L.; Zambias, Robert A.; Hammond, Milton L.; and Chang, Michael N., 4,558,067, Cl. 514-458.000.

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Siegel, Stefan A.; Patterson, David R.; Channin, Donald J.; Sergi, Joseph B., Jr.; and Viola, Jeffrey P., 4,558,465, Cl. 455-609.000.

Chapko, John J.: *See*—
Cohn, Robert J.; and Chapko, John J., 4,557,511, Cl. 292-218.000.

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Whitney, Daniel E., 4,557,549, Cl. 339-258.00R.

Charlton, Newton W., to Security Engineering, Inc. Electric fail-secure/fail-open lock mechanism. 4,557,121, Cl. 70-279.000.

Chaudhuri, Asit R.: *See*—
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Chemplex Company: *See*—
Carrick, Wayne L.; Solvik, R. Sven; and Kirch, William, 4,558,105, Cl. 526-68.000.

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Bechis, Dennis J.; Chen, Hsing-Yao; and Hughes, Richard H., 4,558,253, Cl. 313-414.000.

Cheney, Joseph J., to C.T.M. Company, Inc. Electromechanical actuator. 4,557,177, Cl. 89-1.510.

Cheng, Hsiang T. Exclusive plug for artistic table lamps. 4,558,261, Cl. 315-209.00R.

Cherry, Sidney J.; and Turner, George R., to Westinghouse Electric Corp. Vacuum interrupter guide bushing retainer means. 4,557,529, Cl. 308-4.00R.

Chervenic, Jack: *See*—
Gantley, Francis C.; Chervenic, Jack; and Suconick, David J., 4,558,171, Cl. 174-52.0FP.

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Spanek, Denis, 4,557,188, Cl. 99-415.000.

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Childers, Roger K.; Buchanan, Kenneth L.; and Trumbo, Andrew L., 4,557,282, Cl. 133-3.00A.

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Christoffel, Julius M., Jr., to Gayla Industries, Inc. Positionally adjustable kite strut connector. 4,557,443, Cl. 244-153.00R.

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Ciordinik, Jacques; and Penzo, Alessandro, 4,558,308, Cl. 340-550.000.

Ciba-Geigy AG: *See*—
Leppard, David G.; and Rody, Jean, 4,558,131, Cl. 546-222.000.

Ciba Geigy Corporation: *See*—
Fasciati, Alfred; and Buhler, Arthur, 4,558,121, Cl. 534-641.000.
Smith, Nelson; and Stutts, Joseph W., 4,558,145, Cl. 556-148.000.
Wenk, Paul; Breitenstein, Werner; and Baumann, Marcus, 4,558,043, Cl. 514-210.000.
Zingg, Hanskonrad, 4,557,217, Cl. 118-300.000.

Cincinnati Milacron Inc.: *See*—
Grone, Robert J.; Schnell, Leonard R.; and Vearil, Wayne L., 4,557,783, Cl. 156-257.000.
Wisbey, Jerry D., 4,557,790, Cl. 156-511.000.

Cioca, Gheorghe; Siegler, Marcel; and Spiliadis, Apostol, to Seton Company. Surface active agent compositions. 4,557,855, Cl. 252-355.000.

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Citizen Watch Co., Ltd.: *See*—
Nikaido, Akira; Machida, Takayasu; Hirosawa, Yasuhisa; and Nakajima, Fumio, 4,558,244, Cl. 310-49.00R.

Claes, Paul; Dauby, Christian; Dupont, Camille; and Van Cangh, Luc, to Glaverbel. Method of and apparatus for monitoring the redox state of elements in glass. 4,557,743, Cl. 65-29.000.

Clapp, Roger E., to United States of America, Air Force. Multibeam lens antennas. 4,558,324, Cl. 343-754.000.

Clarion Co., Ltd.: *See*—
Ohara, Seishichi, 4,557,445, Cl. 248-27.100.

Clark, Henry B., III; and Pike, Myron T., to Minnesota Mining and Manufacturing Company. Simulation and cleanup of oil- and/or gas-producing wells. 4,557,837, Cl. 252-8.55C.

Clark, Leland C., Jr.: *See*—
Ackerman, Jerome L.; Clark, Leland C., Jr.; and Thomas, Stephen R., 4,558,279, Cl. 324-315.000.

Clark, Robin D.: *See*—
Kluge, Arthur F.; Clark, Robin D.; and Strosberg, Arthur M., 4,558,129, Cl. 544-377.000.

Clark, Rodney L.: *See*—
Black, Robert A., Jr.; Clark, Rodney L.; Kidder, Kenneth B.; and Patton, Paul B., 4,558,389, Cl. 361-88.000.

Clarke, Edwin E., to Converta-Vans, Inc. Convertible cargo carrier for trailers and the like. 4,557,400, Cl. 222-105.000.

Clawson Tank Company: *See*—
Olinger, Dean E.; and Harding, Robert A., 4,557,406, Cl. 222-564.000.

Clements, Ivan C.; and Spector, George. Striking device. 4,557,477, Cl. 272-76.000.

Cleverley, John A.: *See*—
Marsh, John F.; Cleverley, John A.; and Simpkin, Dennis J., 4,557,872, Cl. 260-504.00A.

Clipp Control: *See*—
Batchelder, Clarence F.; Thomas, Charles E.; and Casady, Kent B., 4,557,178, Cl. 91-367.000.

Clough, Donald K.: *See*—
Bennett, Brian; and Clough, Donald K., 4,557,730, Cl. 8-442.000.

Coates Brothers PLC: *See*—
Wright, Alan J.; O'Hara, Kevin J.; and Turner, Stephen K., 4,558,076, Cl. 523-442.000.

Cochlea Corporation: *See*—
Buckley, Bruce S.; Buckley, Edward M.; and Reichwein, Roy H., 4,557,386, Cl. 209-556.000.

Cockfield, William; Martin, Nancy; and Murray, Barbara, to Frame-Lok, Inc. Attachment assembly. 4,557,457, Cl. 248-544.000.

Codd, Roger D.; Sims, Ronald I.; Olive, Robert B.; and Jobanputra, Amit S., to Lucas Industries. Battery state of charge evaluator. 4,558,281, Cl. 324-433.000.

Coffen, David L.; Holland, George W.; Mandeville, W. Harry; Rosen, Perry; and Wong, Frederick, to Hoffmann-La Roche Inc. Cyclopenta[b]furan-2-ones. 4,558,140, Cl. 549-312.000.

Cohn, Robert J.; and Chapko, John J., to InterMetro Industries Corp. Latch assembly for holding an object in either of two positions. 4,557,511, Cl. 292-218.000.

Coker, Curtis D.: *See*—
Paspek, Stephen C., Jr.; and Coker, Curtis D., 4,557,820, Cl. 208-8.0LE.

Coldiron, Lee C.: *See*—
Fischer, Robert L.; Pulcrano, Frank C.; Coldiron, Lee C.; Topping, Terry M.; Potter, J. H.; and Owens, Robert H., 4,557,661, Cl. 414-730.000.

Cole, Adrian: *See*—
Bangay, Alan J.; Cole, Adrian; and Vernon, John S., 4,557,894, Cl. 419-67.000.

Cole, Raymond C., to International Playtex, Inc. Brassiere and method of making same. 4,557,267, Cl. 128-464.000.

Coleman, Dennis L.: *See*—
Gregonis, Donald E.; Stephen, Robert L.; Coleman, Dennis L.; Hunter, Stephen K.; Hanover, Barry K.; and Harrow, Jeffrey J., 4,557,724, Cl. 604-49.000.

Colgate-Palmolive Company: *See*—
Misevich, Kenneth W.; and Wilson, John L. A., 4,557,059, Cl. 36-32.00R.

Collagen Corporation: *See*—
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Collard, Maurice; and De Goncourt, Louis, to Bertin & Cie. Suspension for a motor vehicle by means of an elastic blade. 4,557,500, Cl. 280-669.000.

Coller, James R.; and Coon, Paul A., to AMP Incorporated. Connector with means for retaining terminals and verifying seating. 4,557,542, Cl. 339-59.00M.

Collins, Mark C.; and Ive, John G. S., to Sony Corporation. Digital television apparatus. 4,558,377, Cl. 360-10.100.

Collins, Roy P.: *See*—
Bohannon, William D., Jr.; Collins, Roy P.; Kinard, Michael D.; and Weinraub, William C. L., 4,557,560, Cl. 350-96.230.

Collins, Royal D., to Procter & Gamble Company, The. Skin cleansing compositions containing alkaline earth metal carbonates as skin feel agents. 4,557,853, Cl. 252-128.000.

Collins, Stephen. Splicing apparatus and cassette therefor. 4,557,789, Cl. 156-505.000.

Colt Industries Operating Corporation: *See*—
Marsland, George H., 4,557,645, Cl. 409-144.000.

Combe, Hubert. Pipe clamp. 4,557,447, Cl. 248-74.100.

Combustion Engineering, Inc.: *See*—
Gibbons, John F.; and Knapp, Richard W., 4,557,891, Cl. 376-397.000.

Comeau, Leon J.; and Birkholz, Roger O., to Comeau, Leon J. Device and method for sensing electric current in a conductor. 4,558,276, Cl. 324-117.00H.

Command Automation, Inc.: *See*—
Simjian, Luther G., 4,557,520, Cl. 297-185.000.

Commandeur, Jacobus J.; Felthuis, Jacob; and Mantel, Piet, to Hoogovens Groep B.V. Vertical spigot joint. 4,557,507, Cl. 285-45.000.

Commissariat a l'Energie Atomique: *See*—
Berthet, Jeanne; Blin, Marie-Francoise; Gaussens, Gilbert; and Noaillac, Jean R., 4,557,749, Cl. 71-64.110.

Compagnie Generale des Matieres Nucleaires: *See*—
Perdijon, Jean, 4,557,145, Cl. 73-621.000.

Compton, Thomas A.: *See*—
Mitch, David S.; Abrams, Lloyd W.; Arnold, Jerry L.; Caudill, Forrester; Compton, Thomas A.; and Boston, Steven L., 4,557,952, Cl. 427-432.000.

Computer Sign Systems Limited: *See*—
Goldman, Saul, 4,558,300, Cl. 340-286.00M.

Cone, Stanley H.: *See*—
Thornton, Peter B.; Cone, Stanley H.; and Booz, George W., 4,557,968, Cl. 428-229.000.

Conley, Michael G.: *See*—
Chen, Herbert; and Conley, Michael G., 4,557,673, Cl. 417-412.000.

Conn, Donald M. Turn-on-red traffic signal. 4,558,299, Cl. 340-81.00R.

Conoco Inc.: *See*—
Beck, Jeffrey L.; and El-Saie, Ahmed A., 4,557,636, Cl. 406-19.000.

Conrad, Roger R.: *See*—
Sircar, Shivaji; Conrad, Roger R.; and Ambs, William J., 4,557,736, Cl. 55-62.000.

Consarc Engineering Ltd.: *See*—
Dick, Thomas R.; and Metcalf, James F., 4,557,757, Cl. 75-49.000.

Consolidated Controls Corporation: *See*—
Reinicke, Robert H., 4,557,726, Cl. 604-67.000.

Construction D'Appereillage: *See*—
Arnoux, Daniel; Haye, Maurice; and Bonneau, Daniel, 4,557,383, Cl. 206-521.000.

Container Corporation of America: *See*—
Carr, William H., Jr.; and Desmond, John D., 4,557,415, Cl. 229-30.000.

Continental White Cap, Inc.: *See*—
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Contraves AG: *See*—
Pedrazza, Donatus, 4,558,320, Cl. 340-870.300.

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Clarke, Edwin E., 4,557,400, Cl. 222-105.000.

Conway, Joseph. Binocular rests. 4,557,451, Cl. 248-187.000.

Cook, Douglas R.: *See*—
Sander, Eugene H.; and Cook, Douglas R., 4,557,938, Cl. 426-453.000.

Cook, John, to BP Chemicals Limited. Preparation of carboxylic acids and esters. 4,558,153, Cl. 560-247.000.

Coombs, Daniel M.: *See*—
Kukes, Simon G.; Hogan, Robert J.; and Coombs, Daniel M., 4,557,823, Cl. 208-216.00R.

Coon, Paul A.: *See*—
Coller, James R.; and Coon, Paul A., 4,557,542, Cl. 339-59.00M.

Cooper, Eugene R., to Procter & Gamble Company, The. Penetrating topical pharmaceutical compositions containing 1-dodecyl-azacycloheptan-2-one. 4,557,934, Cl. 424-128.000.

Cooper Industries, Inc.: *See*—
Koehl, Stephen E.; and Tiller, Charles R., 4,558,280, Cl. 324-399.000.

Coppala, George H.: *See*—
Brod, William B.; Coppala, George H.; and Olds, Delbert L., 4,557,904, Cl. 422-146.000.

Copperi, Maurizio: *See*—
Billi, Roberto; and Copperi, Maurizio, 4,558,187, Cl. 179-170.200.

Corboy, John F., Jr.: *See*—
McGinn, Joseph T.; Jastrzebski, Lubomir L.; and Corboy, John F., Jr., 4,557,794, Cl. 156-612.000.

Cordeiro, August V., to Electric Terminal Corporation. Tool for assembling insulated connector. 4,557,048, Cl. 29-863.000.

Cordis Corporation: *See*—
Harris, Donald L., 4,557,722, Cl. 604-9.000.
Hooven, Michael D., 4,557,721, Cl. 604-9.000.

Corfield, John R.; and Miller, Andrew S., to Lilly Industries Limited. Preparation of cephalosporin intermediate compounds. 4,558,124, Cl. 544-22.000.

Corflex International, Inc.: *See*—
Auer, Jay R., 4,557,091, Cl. 52-282.000.

Corliss, John M.: *See*—
Talbert, Sherwood G.; Flanigan, Lawrence J.; Corliss, John M.; Hagopian, John G.; and Nunheimer, Thomas P., 4,557,253, Cl. 126-429.000.

Corning Glass Works: *See*—
Belmonte, James A.; and Hillman, Arthur E., 4,557,962, Cl. 428-117.000.
Blanding, Wendell S.; Johnson, Ronald E.; and Van Dewoestine, Robert V., 4,557,798, Cl. 156-660.000.
Bonzo, Roy T., 4,557,773, Cl. 156-64.000.
Fay, Robert C.; and Thompson, David A., 4,558,144, Cl. 556-40.000.
Montierth, Max R., 4,557,682, Cl. 425-121.000.

Corno, Maria L.: *See*—
Doria, Gianfederico; Passarotti, Carlo; and Corno, Maria L., 4,558,046, Cl. 514-227.000.

Cornwell, Kenyon L.: *See*—
Schwartz, Charles A.; and Cornwell, Kenyon L., 4,557,103, Cl. 53-111.00R.

Corris, C. James; and Beck, Blaine E., to Cellutron Corporation. Regulated output current source for cordless telephones. 4,558,177, Cl. 179-2.0EA.

Corris, C. James; and Beck, Blaine E., to Cellutron Corporation. Optocoupler interfacing circuit. 4,558,183, Cl. 179-84.00A.

Cosden Technology, Inc.: *See*—
Watson, James M.; and Bailey, Darrell E., 4,558,169, Cl. 585-440.000.

Cosgrove, Robert T.: *See*—
Page, Geoffrey A.; Tokoli, Emery G.; Cosgrove, Robert T.; and Spiewak, John W., 4,557,868, Cl. 260-245.890.

Costabile, John J. Apparatus for producing a bulge in thin metal material. 4,557,128, Cl. 72-62.000.

Cotte, Daniel: *See*—
Chanal, Roger; and Cotte, Daniel, 4,557,290, Cl. 137-510.000.

Coulter Stork Patents B.V.: *See*—
Percic, Milan; Schoonderbeek, Hubertus J.; and Alston, Julia M., 4,557,583, Cl. 355-3.0TR.

Cowan, William S., to Armco Inc. Method and apparatus for remotely cutting broken underwater guidelines. 4,557,628, Cl. 405-191.000.

Craig, Gale M., to General Motors Corporation. Controller for a movable motor vehicle headlamp mechanism. 4,558,259, Cl. 315-82.000.

Cramer, Russell L.: *See*—
Stuparits, Jeffrey J.; and Cramer, Russell L., 4,558,188, Cl. 179-175.20D.

Crawford, Robert F.: *See*—
Mikulas, Martin M., Jr.; and Crawford, Robert F., 4,557,097, Cl. 52-646.000.

Crawford, Wheeler C.: *See*—
Sung, Rodney L.; Zoleski, Benjamin H.; Sweeney, William M.; and Crawford, Wheeler C., 4,557,848, Cl. 252-51.50R.

Creare Research & Development Inc.: *See*—
Sixsmith, Herbert, 4,557,611, Cl. 384-124.000.

Cribbs, Doyle E.; and Weckerly, James R., to GTE Products Corporation. Hand held fiber optic cleaving tool. 4,557,049, Cl. 30-124.000.

Crist, Paul V., Jr. Process for making stained glass tiffany-type lamp shades. 4,557,772, Cl. 156-62.000.

Cromwell Paper Company, The: *See*—
Weil, David M., 4,557,966, Cl. 428-209.000.

Crooks, Donald D.: *See*—
Vidoz, Aldo E.; Crooks, Donald D.; Lewis, Richard E.; Palmer, Ian G.; and Wadsworth, Jeffrey, 4,557,770, Cl. 148-437.000.

Croopnick, Gerald A.; and Zabsky, John M., to Dresser Industries, Inc. Solid discharge mechanism for dewatering system. 4,557,836, Cl. 210-287.000.

Crotty, Charles A.: *See*—
Borowy, Dennis M.; Crotty, Charles A.; Perrins, Allen R.; and Senak, Peter, Jr., 4,558,275, Cl. 324-103.00P.

Crowman, Stanley W. T.; Dornes, Bryan J.; Paukovits, Edward J., Jr.; Spong, Richard V.; and Talarico, Robert J., to AMP Incorporated. Electrical connector clinching means. 4,557,044, Cl. 29-741.000.
Crump, Herschel W. Sound-muffling system. 4,557,349, Cl. 181-279.000.
Csakvary, Tibor; Shum, Lanson Y.; and Miller, Bernard, to Westinghouse Electric Corp. Modular, low cost, pogrammable assembly system. 4,557,663, Cl. 414-751.000.
CSELT - Centro Studi e Laboratori Telecomunicazioni S.p.A.: *See*—
Billi, Roberto; and Copperi, Maurizio, 4,558,187, Cl. 179-170.200.
Modone, Eros, 4,557,914, Cl. 423-303.000.
Cuisinarts, Inc.: *See*—
Williams, James E.; and Kozlowski, Edward R., 4,557,389, Cl. 211-13.000.
Culter, Robert G., to Tektronix, Inc. Scanning method and apparatus. 4,558,372, Cl. 358-264.000.
Cummins Engine Company, Inc.: *See*—
Kamel, Mostafa M.; Wells, Larry D.; and Buchanan, Jerry C., 4,557,221, Cl. 123-1.00A.
Cushman, Robert H.; and Hoegermeyer, Carl L., to AT&T Technologies, Inc. Vacuum pick and place robotic hand. 4,557,514, Cl. 294-64.100.
Cutler, Cassius C.: *See*—
Newton, Steven A.; and Cutler, Cassius C., 4,557,552, Cl. 350-96.150.
Cvacho, Daniel S. Apparatus for trimming a scrap ring from a cylindrical container body and method of operation. 4,557,167, Cl. 82-47.000.
Dabrowa, Andrzej: *See*—
Brzosko, Witold; Janicki, Piotr; Laskowski, Zbigniew; Madalinski, Kazimierz; and Dabrowa, Andrzej, 4,558,011, Cl. 435-272.000.
Dadpey, Habib: *See*—
Zuber, Pierre A.; and Dadpey, Habib, 4,558,415, Cl. 364-426.000.
Dahnert, Dean L., to Spacesaver Corporation. Mobile storage systems with leash control. 4,557,534, Cl. 312-201.000.
Daiguji, Hisashi; and Tanaka, Ikuo, to Harumoto Iron Works Co., Ltd.; and Sumitomo Electric Industries, Ltd. Anchor socket. 4,557,007, Cl. 14-22.000.
Daikin Industries Ltd.: *See*—
Ishikawa, Nobuo; and Kitazume, Tomoya, 4,558,148, Cl. 556-488.000.
Daikin Kogyo Co., Ltd.: *See*—
Enjo, Naonori; Noguchi, Masahiro; and Ide, Satoshi, 4,557,851, Cl. 252-70.000.
Iwatsuki, Shouji, 4,558,152, Cl. 560-219.000.
Ohmori, Akira; Tomihashi, Nobuyuki; and Kitahara, Takahiro, 4,557,562, Cl. 350-96.340.
Daikoku, Takahiro: *See*—
Yamada, Minoru; Masaki, Akira; Yamamoto, Masakazu; Nakanishi, Keiichirou; Nishida, Takashi; Daikoku, Takahiro; Kobayashi, Fumiyuki; and Imai, Kuninori, 4,558,395, Cl. 361-385.000.
Daimler-Benz Aktiengesellschaft: *See*—
Jeglitzka, Maximilian; and von der Ohe, Manfred, 4,557,469, Cl. 267-20.00A.
Joppig, Peter; Peitz, Bernard; and Woschee, Dieter, 4,557,233, Cl. 123-323.000.
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Takatsu, Haruyoshi; and Sato, Hisato, 4,558,151, Cl. 560-118.000.
Dainippon Screen Seizo Kabushiki Kaisha: *See*—
Fujii, Teruo; and Katsuyama, Mikizo, 4,558,214, Cl. 250-216.000.
Daiwa Seiko, Inc.: *See*—
Atobe, Takashi, 4,557,429, Cl. 242-84.420.
Dalen Products, Inc.: *See*—
Caldwell, Edward N., 4,557,069, Cl. 43-122.000.
Damar Holdings B.V.: *See*—
Solomon, Arieh, 4,557,404, Cl. 222-325.000.
Dana, William R.; Friedrich, Ralph S.; and McKenney, John D., to Ameron, Inc. Filament winding of plastic articles. 4,557,788, Cl. 156-425.000.
Danfoss A/S: *See*—
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Petersen, Hans C.; Kyster, Erik; and Thomsen, Svend E., 4,557,676, Cl. 418-61.00B.
Daniels, John F.: *See*—
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Dauby, Christian: *See*—
Claes, Paul; Dauby, Christian; Dupont, Camille; and Van Cangh, Luc, 4,557,743, Cl. 65-29.000.
Davids, Joseph: *See*—
Silvestri, George J., Jr.; and Davids, Joseph, 4,557,113, Cl. 60-693.000.
Davidson, Murray J.; and Chetland, John E., to Repco Engineering (NZ) Limited. Post mounting assembly. 4,557,449, Cl. 248-160.000.
Davis, James W.; DiFloria, Thomas J.; and Propst, Larry D., to Mead Corporation, The. Duplex document copying machines. 4,557,474, Cl. 271-301.000.
Davis, Robert E.; and Robertson, Wilbert J., to Kerr-McGee Chemical Corporation. Borax recovery using sodium metaborate and boric acid intermediates. 4,557,913, Cl. 423-279.000.
Davis, Robert L.: *See*—
Faber, Ulbe; Davis, Robert L.; Fisher, David A.; and McGonagle, Joseph D., 4,558,411, Cl. 364-200.000.
Davy McKee (Sheffield) Limited: *See*—
Bond, Harry L. P., 4,557,130, Cl. 72-225.000.
Dayco Corporation: *See*—
Standley, Paul M., 4,557,680, Cl. 425-3.000.
Wilson, Leslie B., 4,557,032, Cl. 29-434.000.
Dayen, Leonid: *See*—
Hanks, James V.; and Dayen, Leonid, 4,557,506, Cl. 285-39.000.
Dearborn Chemical Company: *See*—
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Dearborn Chemicals Limited: *See*—
Brocklebank, Philip; and Bennison, John J., 4,557,896, Cl. 422-14.000.
Decker, George A., Jr., to AT&T Bell Laboratories. Method of fabricating an optical attenuator by fusion splicing of optical fibers. 4,557,556, Cl. 350-96.210.
Decker, Werner, to Windmoller & Holscher. Apparatus for laying tube or web sections into a folded Z-shaped form. 4,557,712, Cl. 493-11.000.
Dectron Inc.: *See*—
Kittler, Reinhold, 4,557,116, Cl. 62-238.600.
Dee Zee Manufacturing: *See*—
Elwell, Dennis L., 4,557,494, Cl. 280-164.00R.
De Goncourt, Louis: *See*—
Collard, Maurice; and De Goncourt, Louis, 4,557,500, Cl. 280-669.000.
Deguchi, Jichio; and Inoue, Takayuki, to Mitsubishi Petrochemical Co., Ltd. Process for producing a crosslinked product of a silane grafted propylene resin. 4,558,094, Cl. 525-71.000.
Deguchi, Naoyasu: *See*—
Yamagami, Hiroyuki; Hayashi, Yasuhiro; Deguchi, Naoyasu; and Imai, Kiyoshi, 4,558,000, Cl. 430-504.000.
Deimling, Karl; Falk, Roland; Krug, Aribert; Nagel, Peter; and Sand, Rudolf, to BASF Aktiengesellschaft. Process for polishing the surfaces of magnetic storage disks. 4,557,947, Cl. 427-130.000.
Delassus, Jean; and Pierrat, Lambert, to Electricite de France; and CEM - Compagnie Electro-Mecanique. Electromagnetic pump. 4,557,667, Cl. 417-50.000.
DeLay, Victor A., Jr., to E-Z Out Container Corp. Portable container with interlocking funnel. 4,557,395, Cl. 220-86.00R.
DeLorean, John Z. Swash plate engine. 4,557,232, Cl. 123-320.000.
Demchenko, Yaroslav P.: *See*—
Golik, Georgy A.; Demchenko, Yaroslav P.; Lozinsky, Miron O.; Malovik, Vladlen V.; and Semeny, Valery Y., 4,557,754, Cl. 71-98.000.
De Monte, Arthur P.: *See*—
Kanner, Bernard; Quirk, Jennifer M.; De Monte, Arthur P.; and Mehta, Kunj R., 4,558,146, Cl. 556-410.000.
Dempsey, Levi T., Jr. Biofeedback system. 4,557,275, Cl. 128-782.000.
Demyon, Thomas R. Safety sight. 4,557,216, Cl. 116-227.000.
DenBeste, Steven C.; Boyce, Douglas G.; Blattner, John D.; and Hillen, Kenneth K., to Tektronix, Inc. Digital signal sampling system with two unrelated sampling timebases. 4,558,422, Cl. 364-480.000.
Denice C. Reich Inc.: *See*—
Volk, Russell D., 4,557,351, Cl. 184-18.000.
DeNise, Richard A., to Stone Construction Equipment, Inc. Alignment mechanism for ram type compactors. 4,557,336, Cl. 173-90.000.
Denison, Early B.; and Picard, Jean-Claude M., to Shell Offshore Inc. Drilling riser locking apparatus and method. 4,557,332, Cl. 166-345.000.
Dennison Manufacturing Company: *See*—
Magnotta, Frank A., 4,557,964, Cl. 428-187.000.
DePonti, Luigi, to Alfonso Bialetti & Co., Fonderia in Conchiglia S.p.A. Household appliance for preparing hot beverages. 4,557,187, Cl. 99-279.000.
dePoorter, Johannes A.; deWaard, Peter J.; Tijburg, Rudolf P.; and Dinghs, Gerardus L., to U.S. Philips Corporation. Semiconductor laser with end zones for reducing non-radiating recombination. 4,558,448, Cl. 372-44.000.
Derby, Richard: *See*—
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Derendinger, Max: *See*—
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Kiess, Helmut G.; Binggeli, Bruno K.; and Derendinger, Max, 4,557,886, Cl. 264-105.000.
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Molina, Jorge W., 4,557,650, Cl. 411-108.000.
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Meisner, Alfred; Arnold, Werner; Eggebrecht, Frank; and Grasser, Hans, 4,557,606, Cl. 368-204.000.
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Donnelly, Thomas L.; and Pavlovych, Orest, to Xerox Corporation. Development apparatus in which the escape of particles is minimized. 4,557,584, Cl. 355-3.0DD.
Donovan, James P. Cushioned activity surface with closed cell foam pad bonded to hard surface and rubber mat. 4,557,475, Cl. 272-3.000.
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Drake, Leo O. Printed circuit board storage cabinet. 4,558,398, Cl. 361-415.000.
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Croopnick, Gerald A.; and Zabsky, John M., 4,557,836, Cl. 210-287.000.
James, Barry K., 4,558,404, Cl. 363-37.000.
LeBlanc, Aladain J.; and Turney, Robert A., 4,558,219, Cl. 250-260.000.
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Sibalis, Dan, 4,557,723, Cl. 604-20.000.
Drullinger, Robert E., to United States of America, Commerce. Heat pipe oven molecular beam source. 4,558,218, Cl. 250-251.000.
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Drury, Alvin C., to Jung Corporation. Protective hand pad, and method of making same. 4,556,992, Cl. 2-20.000.
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Drutchas, Gilbert H., to TRW Inc. Hydraulic apparatus. 4,557,342, Cl. 180-132.000.
DuBois, Chester G., to Outboard Marine Corporation. Mechanism for producing audible warning in response to coolant system failure. 4,557,224, Cl. 123-41.150.
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Dumbeck, Robert F. Energy efficient building with underground concrete walls. 4,557,084, Cl. 52-169.110.
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Jones, Willard J.; and Gannett, Thomas P., 4,558,164, Cl. 568-585.000.
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Dwyer, Robert A.; and Gillberg, James E., to RCA Corporation. Multiple connection bond pad for an integrated circuit device and method of making same. 4,558,345, Cl. 357-68.000.
Dyck, John W. Portable form for lining irrigation ditches. 4,557,633, Cl. 405-268.000.

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Foust, Ronald L., 4,557,405, Cl. 222-539.000.
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Eastman, Robert E., II; and Gray, Dale W. Arrow game tracker. 4,557,243, Cl. 124-88.000.
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Tinholt, Thomas H., 4,557,357, Cl. 192-3.210.
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Eckberg, Richard P.; Striker, Richard A.; and Modic, Frank J., to General Electric Company. Ultraviolet radiation-curable silicone release compositions. 4,558,147, Cl. 556-427.000.
Eckert, Rudolf J. A., to Shell Oil Company. Process for the preparation of oil-soluble hydrogenated modified star-shaped polymers. 4,557,849, Cl. 252-51.50R.
Edakubo, Hiroo; Takayama, Nobutoshi; and Takimoto, Hiroyuki, to Canon Kabushiki Kaisha. Video signal reproducing apparatus. 4,558,382, Cl. 360-77.000.
Edwards, Colin W.; and Murray, Kenelm G. D., to Hughes Microelectronics Limited. Non-volatile semiconductor memory circuits. 4,558,432, Cl. 365-154.000.
Edwards, David W., to Motorola, Inc. Variable rate bi-directional slew control and method therefor. 4,558,231, Cl. 307-271.000.
Edwards, Philip L. Chewable toy for animal. 4,557,219, Cl. 119-29.500.
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Meisner, Alfred; Arnold, Werner; Eggebrecht, Frank; and Grasser, Hans, 4,557,606, Cl. 368-204.000.
Eglin, Steven, to Scapa-Porritt Limited. Automatic seaming machine. 4,557,025, Cl. 28-141.000.
Egrie, Joan C., to Kirin-Amgen, Inc. A.T.C.C. HB8209 and its monoclonal antibody to erythropoietin. 4,558,006, Cl. 435-7.000.
Eibe, Werner W., to White Consolidated Industries, Inc. Composite inflatable crown roll. 4,557,028, Cl. 29-113.00R.
Eickmann, Karl. Fluid pumps, fluid motors and devices, wherein they are applied. 4,557,347, Cl. 180-308.000.
Eickmann, Karl. Hydraulically controlled, fluid-stream driven vehicle. 4,557,438, Cl. 244-60.000.
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Elggren, Richard W., to Exact-1-Dent, Incorporated. Human identification system. 4,557,693, Cl. 433-229.000.
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McShane, Lawrence J., 4,558,123, Cl. 544-16.000.
Merkel, Kurt E., 4,558,036, Cl. 514-9.000.
Rolski, Stanislaw; and Pfeiffer, Ralph R., 4,558,053, Cl. 514-283.000.
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Beck, Jeffrey L.; and El-Saie, Ahmed A., 4,557,636, Cl. 406-19.000.
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Elwell, Dennis L., to Dee Zee Manufacturing. Running board. 4,557,494, Cl. 280-164.00R.
Emanuel, Nikolai M.; Rozenberg, Albina N.; Golubev, Valery A.; Bogdanov, Gennady N.; Vasilieva, Ljubov S.; and Konovalova, Nina P. 5-Fluorouracil nitroxyl derivatives possessing antitumor activity. 4,558,127, Cl. 544-310.000.
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Braithwaite, David; Walker, Richard A.; Bystrianyk, Wasyl; Scott, Paul F.; and Douglas, Robert J., 4,557,746, Cl. 65-163.000.
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Wittes, James M.; and Sweeney, Cecilia, 4,557,825, Cl. 209-3.000.
Energy Absorption Systems, Inc.: *See*—
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English, George J.: *See*—
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Enjo, Naonori; Noguchi, Masahiro; and Ide, Satoshi, to Daikin Kogyo Co., Ltd. Working fluids for the Rankine cycle comprising trichlorofluoromethane and 1,1-difluoroethane, isobutane or octafluorocyclobutane. 4,557,851, Cl. 252-70.000.
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Epenoy, Gabriel; and Kuhne, Roland, to International Business Machines Corporation. Data transmission system. 4,558,455, Cl. 375-112.000.
EPSM Inc.: *See*—
Beliveau, Jean L., 4,557,093, Cl. 52-405.000.
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a contaminated catalyst solution originating from the carbonylation of methyl acetate and/or dimethylether. 4,557,760, Cl. 75-121.000.
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Bencz, Gyozo ; Deres, Janos; and Tuti, Peter, 4,557,771, Cl. 149-14.000.
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Esser, Wilhelm C. J., to AMP Incorporated. Terminal for connecting a lead wire to a coil wire. 4,557,544, Cl. 339-97.00R.
ETA S.A., Fabriques d'Ebauches: *See*—
Bergmann, Erich, 4,557,981, Cl. 428-627.000.
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Kirsch, Warren B.; and Laurent, Sebastian M., 4,557,921, Cl. 423-488.000.
Etoh, Yukihiro; Tanaka, Toshiaki; Kanesaki, Nobukazu; and Miyazaki, Hiroaki, to Nissan Motor Co., Ltd. Swirl chamber for internal combustion engine. 4,557,230, Cl. 123-263.000.
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Beaver, Richard N.; Evans, Kenneth R.; and Waters, Donald D., 4,557,810, Cl. 204-98.000.
Evans, Morris L.; and Small, Augustus B., to Exxon Research & Engineering Co. Aromatic high softening point petroleum resins and process for its preparation. 4,558,107, Cl. 526-237.000.
Everett, John E., Jr., to General American Transportation Corporation. Lifting structure for railway tank car. 4,557,199, Cl. 105-362.000.
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Elggren, Richard W., 4,557,693, Cl. 433-229.000.
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Arcuri, Kym B.; Mauldin, Charles H.; and Shaw, Dave H., 4,558,030, Cl. 502-325.000.
Bearden, Roby, Jr.; and Aldridge, Clyde L., 4,557,822, Cl. 208-112.000.
Best, Steven A., 4,558,024, Cl. 502-115.000.
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Bronson, Stanley O.; Peterson, John R.; and Schumacher, Edward B., 4,558,016, Cl. 501-95.000.
Chen, Frank J.; and Brownawell, Darrell W., 4,558,170, Cl. 585-532.000.
Evans, Morris L.; and Small, Augustus B., 4,558,107, Cl. 526-237.000.
Gutierrez, Antonio; Brownawell, Darrell W.; and Bloch, Ricardo, 4,557,847, Cl. 252-51.50A.
Marsh, John F.; Cleverley, John A.; and Simpkin, Dennis J., 4,557,872, Cl. 260-504.00A.
Wisotsky, Max J., 4,557,846, Cl. 252-51.50A.
F. L. Smidth & Co. A/S: *See*—
Nielsen, Peter B., 4,557,688, Cl. 432-14.000.
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Facit Aktiebolag: *See*—
Mattsson, Sten I., 4,557,193, Cl. 101-93.480.
Faehnle, Erich, to PKA Pyrolyse Kraftanlagen GmbH. Process and apparatus for treating waste materials. 4,557,204, Cl. 110-346.000.
FAG Kugelfischer Georg Schafer Kommanditgesellschaft Auf.Akt.: *See*—
Knappe, Bernhard, 4,557,614, Cl. 384-573.000.
Fah, Ah N. Automatic watering and feeding system for plants. 4,557,071, Cl. 47-81.000.
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Gaston, John C.; and Fairall, Richard K., 4,557,030, Cl. 29-402.060.
Fairbanks, David W., to RCA Corporation. Alignment and insertion apparatus for an information-containing disc stylus. 4,557,040, Cl. 29-720.000.
Falk, Roland: *See*—
Deimling, Karl; Falk, Roland; Krug, Aribert; Nagel, Peter; and Sand, Rudolf, 4,557,947, Cl. 427-130.000.
Falknor, Charles L.; Vetter, Vincent H.; Wolfer, Dale R.; and Lyon, Dalton K., to Hughes Tool Company. Borehole conditioning apparatus. 4,557,339, Cl. 175-325.000.
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Fanuc Ltd.: *See*—
Nakashima, Seiichiro; Torii, Nobutoshi; and Hamura, Masayuki, 4,557,660, Cl. 414-730.000.
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Ishida, Hiroshi; Fujioka, Yoshiki; and Ota, Naoto, 4,558,269, Cl. 318-811.000.
Farleigh, James R. Method and apparatus for improving directional stability of motor vehicles. 4,557,501, Cl. 280-673.000.
Farmerie, John J., to Calgon Carbon Corporation. Regeneration of caustic impregnated activated carbons. 4,558,022, Cl. 502-25.000.
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Bernardi, Luigi; Lazzari, Ettore; Malnati, Maria L.; Mazzini, Giuseppe; Pegrassi, Lorenzo; and Rossi, Alessandro, 4,558,049, Cl. 514-234.000.
Doria, Gianfederico; Passarotti, Carlo; and Corno, Maria L., 4,558,046, Cl. 514-227.000.
Foglio, Maurizio; Franceschi, Giovanni; Scarafile, Cosimo; Arcamone, Federico; and Sanfilippo, Aurora, 4,558,042, Cl. 514-192.000.
Farmland Industries, Inc.: *See*—
Stewart, Norman L., Jr.; and Kranz, Ken E., 4,557,748, Cl. 71-32.000.
Farquharson, Robert J.; and Gerns, Stanton T., to AT&T Information Systems; and AT&T Bell Laboratories. Interconnected solder pads and the method of soldering. 4,557,411, Cl. 228-56.300.
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Fay, Robert C.; and Thompson, David A., to Corning Glass Works. Volatile metal complexes. 4,558,144, Cl. 556-40.000.
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Glasauer, Rudolf; and Feigel, Josef, 4,558,245, Cl. 310-67.00R.
Fekete, George T.: *See*—
Badesha, Santokh S.; and Fekete, George T., 4,557,922, Cl. 423-510.000.
Felthuis, Jacob: *See*—
Commandeur, Jacobus J.; Felthuis, Jacob; and Mantel, Piet, 4,557,507, Cl. 285-45.000.
Fender Musical Instruments Corporation: *See*—
Gressett, Charles A., Jr., 4,557,174, Cl. 84-293.000.
Fenton, Frank A.; Booth, Brian; Jones, Stanley P.; and Gennard, Derek, to Emhart Industries, Inc. Mould arrangement for a glassware forming machine. 4,557,744, Cl. 65-29.000.
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Barkis, Edward D.; Moore, Douglas G.; Fernald, Allen M.; and McClellan, Felton L., 4,557,958, Cl. 428-36.000.
Fernandez, Jose M.; and Bulcourt Carlos J. Pneumatic walking brace and operating system. 4,557,257, Cl. 128-80.00G.
Ferrieri, John, to Boeing Company, The. Method and apparatus for lifting a block. 4,557,513, Cl. 294-1.100.
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Lucchini, Giuseppe, 4,557,144, Cl. 73-313.000.
Fiber Controls Corporation: *See*—
Nash, Ronald S.; and Cash, L. Dale, 4,557,021, Cl. 19-80.00R.
Fielden, John S., to South Eastern Electricity Board. Methods of and apparatus for converting an analogue voltage to a digital representation. 4,558,303, Cl. 340-347.0AD.
Fields, Gerald S., to Champion Laboratories, Inc. Two stage filter. 4,557,829, Cl. 210-132.000.
Fink, Hans-Ferdi: *See*—
Callaghan, Ian C.; Fink, Hans-Ferdi; Gould, Clive M.; Koerner, Gotz; Patzke, Hans-Jurgen; and Weitemeyer, Christian, 4,557,737, Cl. 55-87.000.
Firestone, Raymond A., to Merck & Co., Inc. Phenyl, trihalomethyl or heteroaryl sulfoxides having a latent allyl group bound to sulfur as enzyme inhibitors. 4,558,071, Cl. 514-570.000.
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Graves, Daniel F., 4,557,306, Cl. 152-548.000.
Hergenrother, William L.; and Halasa, Adel F., 4,558,103, Cl. 525-538.000.
Fischer, Robert L.; Pulcrano, Frank C.; Coldiron, Lee C.; Topping, Terry M.; Potter, J. H.; and Owens, Robert H., to ACF Industries, Incorporated. Robot safety mechanism. 4,557,661, Cl. 414-730.000.
Fischer, Rudolf, to Maag Gear-wheel & Machine Company Limited. Cutting tool for planing gear tooth flanks. 4,557,639, Cl. 407-20.000.
Fisher, David A.: *See*—
Faber, Ulbe; Davis, Robert L.; Fisher, David A.; and McGonagle, Joseph D., 4,558,411, Cl. 364-200.000.
Fisher, Harry M.; and Fisher, Stuart N., to Talon, Inc. Slide fastener chain apparatus of manufacture. 4,557,027, Cl. 29-33.200.
Fisher, Stuart N.: *See*—
Fisher, Harry M.; and Fisher, Stuart N., 4,557,027, Cl. 29-33.200.
Fitterer, Horst; Roos, Roland; Muenzner, Wulf; Balz, Werner; and Berger, Heinz, to BASF Aktiengesellschaft. Tape cassette and spring member therefor. 4,557,433, Cl. 242-187.000.
Flanigan, Lawrence J.: *See*—
Talbert, Sherwood G.; Flanigan, Lawrence J.; Corliss, John M.; Hagopian, John G.; and Nunheimer, Thomas P., 4,557,253, Cl. 126-429.000.
Flexion, Inc.: *See*—
Jurden, Jerry E., 4,557,008, Cl. 14-71.700.
Fling, Russell T.; and Willis, Donald H., to RCA Corporation. Hue correction circuit for a digital TV receiver. 4,558,351, Cl. 358-28.000.

Flucher, Wolfgang; and Siewert, Wolfgang, to Escher Wyss GmbH. Method of and apparatus for separating tacky contaminants from a stock suspension. 4,557,826, Cl. 209-11.000.
FMC Corporation: *See*—
Mick, Jon L., 4,557,390, Cl. 212-197.000.
Poock, Darwin N.; and Rathe, Robert A., 4,557,391, Cl. 212-270.000.
Rosseau, Richard B., 4,557,010, Cl. 15-83.000.
Foell, Helmut; Grabmaier, Josef; and Schneider, Juergen, to Siemens Aktiengeselischaft. Method and apparatus for drawing crystalline bodies from a melt. 4,557,793, Cl. 156-608.000.
Foglio, Maurizio; Franceschi, Giovanni; Scarafile, Cosimo; Arcamone, Federico; and Sanfilippo, Aurora, to Farmitalia Carlo Erba S.p.A. β-Lactam-containing antibacterial agents and β-lactamase inhibitors. 4,558,042, Cl. 514-192.000.
Fooshee, Robert. Conductive fluid optical display panel and method of manufacture. 4,558,314, Cl. 340-788.000.
Forbes, Mel L.; and Venaleck, John T., to 4C Electronics, Inc. Programmed socket and contact. 4,557,540, Cl. 339-17.0CF.
Ford-Hutchinson, Anthony W.: *See*—
Chan, Chi-Chung; and Ford-Hutchinson, Anthony W., 4,558,037, Cl. 514-20.000.
Ford, James A.; Staack, Gerald F.; and Waite, Phillip, to Boise Cascade Corporation. Membrane-type end closure member. 4,557,414, Cl. 229-5.500.
Ford Motor Company: *See*—
Allor, Richard L., 4,557,244, Cl. 125-1.000.
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Dudas, Ferenc; and Levardy, Ivan, 4,557,642, Cl. 408-239.00R.
Forsgren, Roland; Garpendahl, Gunnar; Eriksson, Hans; and Wallentin, Bengt, to KB WIBRA. Method and apparatus for monitoring the tool status in a tool machine with cyclic machining. 4,558,311, Cl. 340-680.000.
Fortino, Placido S.; Haas, Laird K. S.; Hong, Siu-Ping; Lo, Wing C.; and Neupauer, Edward J., to AT&T Bell Laboratories. Balanced dual-gap protector. 4,558,390, Cl. 361-119.000.
Fortman, Lloyd D.; and Kinter, Mark D., to Tennant-Company. Sweeper with precleaner and/or demister. 4,557,739, Cl. 55-320.000.
Foster, Thomas C.; Goldman, Jon C.; and Hoeye, Gary W., to Thermco Systems, Inc. Process for deposition of borophosphosilicate glass. 4,557,950, Cl. 427-255.000.
Fotland, Richard A. Electrostatic imaging device. 4,558,334, Cl. 346-159.000.
Foust, Ronald L., to Dyson-Kissner-Moran Corporation, The. Reversible closure-spout assembly. 4,557,405, Cl. 222-539.000.
Frame-Lok, Inc.: *See*—
Cockfield, William; Martin, Nancy; and Murray, Barbara, 4,557,457, Cl. 248-544.000.
Franceschi, Giovanni: *See*—
Foglio, Maurizio; Franceschi, Giovanni; Scarafile, Cosimo; Arcamone, Federico; and Sanfilippo, Aurora, 4,558,042, Cl. 514-192.000.
Francesville Drain Tile Corporation: *See*—
Overmyer, Stephen R., 4,557,510, Cl. 285-305.000.
Francis, Samuel: *See*—
Sherman, Benjamin F., Jr.; and Francis, Samuel, 4,557,484, Cl. 273-153.00S.
Frech, Alfred: *See*—
Berger, Gunther; and Frech, Alfred, 4,557,305, Cl. 144-230.000.
Freeman, Joseph W.; Kraft, Wayne R.; Kurtz, Hobart L.; and Magrisso, Israel B., to International Business Machines Corporation. Self-testing facilities of off-chip drivers for processor and the like. 4,558,447, Cl. 371-71.000.
Frei, Theo: *See*—
Ragettli, Christian; and Frei, Theo, 4,557,135, Cl. 72-420.000.
Freliech, Robert A., to Carrier Corporation. Contact monitor-annunciator. 4,558,306, Cl. 340-520.000.
Frenkel, Robert L., to Adolph Coors Company. Magnetic drum for separating ferrous and non-ferrous beverage containers. 4,557,387, Cl. 209-636.000.
Fresenius AG: *See*—
Neumann, Hans-Jurgen; and Meisberger, Artur, 4,557,719, Cl. 494-37.000.
Freundt, Klaus. Optical apparatus for exposure and/or image reproduction of microfiche sheet film, and cassette suitable therefor. 4,557,595, Cl. 355-72.000.
Fricke, Erich: *See*—
Strunck, Theo; and Fricke, Erich, 4,557,808, Cl. 204-29.000.
Fricke, Gunter; Geisler, Iring; and Zentgraf, Helmut, to Kali und Salz AG. Electrostatic free-fall separator with feeding arrangement. 4,557,827, Cl. 209-127.400.
Fried. Krupp Gesellschaft mit beschrankter Haftung: *See*—
Gudesen, Alwin, 4,558,439, Cl. 367-127.000.
Heimann, Bernhard, 4,557,428, Cl. 242-82.000.
Friedman, Leonard I., to American National Red Cross. Cup insert for balancing. 4,557,717, Cl. 494-10.000.
Friedrich, Ralph S.: *See*—
Dana, William R.; Friedrich, Ralph S.; and McKenney, John D., 4,557,788, Cl. 156-425.000.
Fries, Alexis: *See*—
Oehler, Oskar; and Fries, Alexis, 4,557,603, Cl. 356-418.000.
Froment, Jean-Paul, to S.A. des Etablissements Staubli. Dobbies incorporating double swinging levers for weaving looms. 4,557,298, Cl. 139-71.000.
Fudickar, Harald; and Thies, Peter, to Wagener Schwelm GmbH & Co. Belt press with upper and lower bend compensators. 4,557,791, Cl. 156-580.000.
Fuerste, William C. Method and device for discouraging cigarette smoking. 4,557,279, Cl. 131-270.000.
Fufukawa, Yoshimi: *See*—
Sano, Shoichi; and Fufukawa, Yoshimi, 4,557,493, Cl. 280-91.000.
Fugner, Armin: *See*—
Mentrup, Anton; Schromm, Kurt; Renth, Ernst-Otto; Muacevic, Gojko; and Fugner, Armin, 4,558,061, Cl. 514-392.000.
Fuji Electric Company: *See*—
Yokomori, Shinji; and Ushijima, Yoshio, 4,557,366, Cl. 194-100.00A.
Fuji Jukogyo Kabushiki Kaisha: *See*—
Sakakiyama, Ryuzo, 4,558,414, Cl. 364-424.100.
Fuji Photo Film Co., Ltd.: *See*—
Aoki, Kozo; Ogawa, Akira; and Tanabe, Osami, 4,557,999, Cl. 430-385.000.
Aotsuka, Yasuo; and Yamamoto, Soichiro, 4,558,002, Cl. 430-538.000.
Arai, Yoshihiro; and Nahara, Akira, 4,557,944, Cl. 427-39.000.
Horie, Seiji; Kawamura, Kouichi; Makino, Naonori; and Sato, Hideo, 4,557,988, Cl. 430-58.000.
Ichikawa, Koji, 4,557,425, Cl. 242-55.000.
Iwasaki, Masayuki; and Umehara, Akira, 4,557,997, Cl. 430-325.000.
Kohno, Atsuo; and Shiiba, Minoru, 4,557,574, Cl. 354-288.000.
Komiyama, Choji; Oishi, Kengo; Suzuki, Osamu; and Iyota, Yasumasa, 4,557,380, Cl. 206-387.000.
Nagano, Teruo; Nakakita, Eiji; and Sekiya, Toshiyuki, 4,557,994, Cl. 430-162.000.
Ochi, Shigeharu, 4,558,365, Cl. 358-212.000.
Yamagami, Hiroyuki; Hayashi, Yasuhiro; Deguchi, Naoyasu; and Imai, Kiyoshi, 4,558,000, Cl. 430-504.000.
Yamamoto, Nobuyuki; Yabe, Masao; Nishikawa, Yasuo; Yanai, Akio; Shirahata, Ryuji; and Naruo, Kyoichi, 4,557,948, Cl. 427-131.000.
Yokoyama, Shigeki; Okamura, Hisashi; Maekawa, Yukio; and Kawasaki, Hiroshi, 4,558,001, Cl. 430-527.000.
Fuji Seimitsu Mfg. Co., Ltd.: *See*—
Masuda, Makoto; Iwasita, Hiroshi; and Kuwabara, Toshihiko, 4,557,654, Cl. 411-431.000.
Fuji Xerox Co., Ltd.: *See*—
Kurata, Masami; and Ohmori, Takashi, 4,558,374, Cl. 358-287.000.
Saitoh, Koichi; Horie, Kiyoshi; Itami, Teruhiko; and Kimoto, Toshifumu, 4,558,327, Cl. 346-74.200.
Fujii, Masaaki: *See*—
Kitamori, Takehiko; Fujii, Masaaki; and Sawada, Tsuguo, 4,557,137, Cl. 73-24.000.
Fujii, Teruo; and Katsuyama, Mikizo, to Dainippon Screen Seizo Kabushiki Kaisha. Transmission illumination device in a picture scanning device. 4,558,214, Cl. 250-216.000.
Fujikura Ltd.: *See*—
Suzuki, Fumio; Ohnuma, Toshio; Koga, Kazuyuki; and Watanabe, Tatsuya, 4,557,046, Cl. 29-749.000.
Fujikura, Takashi: *See*—
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Yokoyama, Yasuyuki; Hatano, Takayoshi; Suzuki, Kenji; and Fujioka, Koichiro, 4,557,592, Cl. 355-51.000.
Fujioka, Yoshiki: *See*—
Ishida, Hiroshi; Fujioka, Yoshiki; and Ota, Naoto, 4,558,269, Cl. 318-811.000.
Fujisawa Pharmaceutical Co., Ltd.: *See*—
Takaya, Takao; and Tozuka, Zenzaburo, 4,558,047, Cl. 514-229.000.
Fujita, Hiroshi: *See*—
Mori, Hirotaro; and Fujita, Hiroshi, 4,557,765, Cl. 148-4.000.
Fujitani, Kenji: *See*—
Maeda, Masahiko; Watanabe, Naotochi; and Fujitani, Kenji, 4,557,859, Cl. 252-511.000.
Fujitsu Limited: *See*—
Baba, Fumio; Mochizuki, Hirohiko; and Miyahara, Hatsuo, 4,558,434, Cl. 365-189.000.
Kida, Susumu; Usami, Hayato; and Aoki, Hideji, 4,558,346, Cl. 357-74.000.
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Ohkuma, Yuji, 4,557,785, Cl. 156-345.000.
Suzuki, Yasuo; Hirao, Hiroshi; and Suzuki, Yasuaki, 4,558,241, Cl. 307-530.000.
Fujiwara, Masayuki: *See*—
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Fukatsu, Yasushi: *See*—
Ariizumi, Syoji; Fukatsu, Yasushi; and Masuoka, Fujio, 4,558,343, Cl. 357-51.000.
Fukaya, Hiroyasu: *See*—
Akiyama, Susumu; Ito, Kenzo; Fukaya, Hiroyasu; Ogiso, Haruhiko; Hirabayashi, Yuji; and Kawamura, Takahide, 4,558,417, Cl. 364-431.110.
Fukaya, Masaki: *See*—
Nakagawa, Katsumi; Mochizuki, Noritaka; Komatsu, Toshiyuki; Fukaya, Masaki; and Kuno, Mitsutoshi, 4,558,357, Cl. 358-75.000.
Fukuda, Hideo: *See*—
Onitsuka, Hatsuki; Saito, Shin; and Fukuda, Hideo, 4,557,830, Cl. 210-198.200.

Fukuda, Masao, to Kabushiki Kaisha Ishida Koki Seisakusho. Method of combinatorial weighing in a combinatorial weighing machine. 4,557,340, Cl. 177-1.000.

Fukuda, Tadaji: *See*—
Nakagawa, Katsumi; Komatsu, Toshiyuki; Hirai, Yutaka; Misumi, Teruo; and Fukuda, Tadaji, 4,557,990, Cl. 430-84.000.
Shirai, Shigeru; Kanbe, Junichiro; and Fukuda, Tadaji, 4,557,987, Cl. 430-58.000.

Fukunaga, Takao, to Kabushiki Kaisha Daikin Seisakusho. Method and device for automatic control of transmission. 4,557,162, Cl. 74-866.000.

Fukushi, Yukihiro, to Tokyo Shibaura Denki Kabushiki Kaisha. Sorting apparatus. 4,557,589, Cl. 355-14.0SH.

Fulkerson, Robert D., to Munters Corporation. Splash-type fill. 4,557,878, Cl. 261-111.000.

Fuller, Gene E.; and Lin, Yi-Ching, to Texas Instruments Incorporated. Resist process using anti-reflective coating. 4,557,797, Cl. 156-643.000.

Furia, Edoardo; and La Corte, Carlo. Machine for producing and dispensing ice-lollies and the like. 4,557,117, Cl. 62-340.000.

Furst, Leander; and Holzer, Walter, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung; and Elo-Chem Atztechnik GmbH. Regeneration of an ammoniacal etching solution with recycling of solution with electrolytically reduced metal content to the regeneration input. 4,557,811, Cl. 204-105.00R.

Furubayashi, Hisatoshi: *See*—
Tanaka, Junichi; Furubayashi, Hisatoshi; Watanabe, Masanori; and Hijikigawa, Masaya, 4,558,393, Cl. 361-286.000.

Furukawa Electric Co., Ltd., The: *See*—
Kunieda, Hiroshi; Yamamoto, Hiroshi; Nishkawa, Yuji; and Enpuku, Yoshihiko, 4,557,897, Cl. 422-15.000.

Fushiki, Yasuo: *See*—
Uekita, Masakazu; Fushiki, Yasuo; and Ooizumi, Masayuki, 4,557,784, Cl. 156-307.700.

Futami, Toru: *See*—
Noso, Kazunori; Kishi, Norimasa; and Futami, Toru, 4,558,459, Cl. 381-43.000.

G. D. Societa' per Azioni: *See*—
Seragnoli, Enzo, 4,557,277, Cl. 131-84.300.

Gaisser, Horst: *See*—
Weiss, Arno; and Gaisser, Horst, 4,557,057, Cl. 34-48.000.

Gajajiva, Padej; and Wium, Eigil, to General Signal Corporation. Hazardous location expansion fitting. 4,558,173, Cl. 174-86.000.

Galardy, Richard E.; and Grobelny, Damian, to University of Kentucky, The Board of Trustees of the. Inhibitors of bacterial collagenase. 4,558,034, Cl. 514-7.000.

Gall, Adam F., to McJunkin Corporation. Remote control fracture valve. 4,557,325, Cl. 166-97.000.

Galloway, Roy C., to Lilliwyte Societe Anonyme. Method of making an electronically conductive tectosilicate, and such tectosilicate when made according to the method. 4,557,858, Cl. 252-508.000.

Ganellin, Charon R.; Ife, Robert J.; and Owen, David A. A., to Smith Kline & French Laboratories Limited. 2-Substituted alkylaminopyrimidones. 4,558,128, Cl. 544-320.000.

Gannett, Thomas P.: *See*—
Jones, Willard J.; and Gannett, Thomas P., 4,558,164, Cl. 568-585.000.

Gantley, Francis C.; Chervenic, Jack; and Suconick, David J., to General Electric Company. Hermetic enclosure for electronic components with an optionally transparent cover and a method of making the same. 4,558,171, Cl. 174-52.0FP.

GAO Gesellschaft fur Automation und Organisation mbH: *See*—
Muller, Hans; and May, Stefan, 4,557,596, Cl. 355-132.000.

Gardner, Gary L.; and Greathouse, Chester K., to Powermatic - Houdaille, Inc. Spindle shaper. 4,557,303, Cl. 144-145.00A.

Garpendahl, Gunnar: *See*—
Forsgren, Roland; Garpendahl, Gunnar; Eriksson, Hans; and Wallentin, Bengt, 4,558,311, Cl. 340-680.000.

Garwin, Richard L.; and Levine, James L., to International Business Machines Corporation. Indicator to data processing interface. 4,558,313, Cl. 340-709.000.

Gasbarro, Geno N. Apparatus for filleting meat from poultry breast sections. 4,557,017, Cl. 17-11.000.

Gaston, John C.; and Fairall, Richard K. Multipurpose apparatus and method for tuning and grooving a ski. 4,557,030, Cl. 29-402.060.

Gaussens, Gilbert: *See*—
Berthet, Jeanne; Blin, Marie-Francoise; Gaussens, Gilbert; and Noaillac, Jean R., 4,557,749, Cl. 71-64.110.

Gayla Industries, Inc.: *See*—
Christoffel, Julius M., Jr., 4,557,443, Cl. 244-153.00R.

Gearhart Industries, Inc.: *See*—
Evans, Hilton B., 4,558,220, Cl. 250-269.000.

Gebr. Thonet GmbH: *See*—
Lange, Gerd, 4,557,521, Cl. 297-285.000.

Gehrmann, Klaus: *See*—
Erpenbach, Heinz; Gehrmann, Klaus; Lork, Winfried; and Prinz, Peter, 4,557,760, Cl. 75-121.000.

Geisler, Iring: *See*—
Fricke, Gunter; Geisler, Iring; and Zentgraf, Helmut, 4,557,827, Cl. 209-127.400.

Geiss, Vernon L.: *See*—
Gravely, Lawrence E.; Geiss, Vernon L.; and Gregory, Charles F., 4,557,280, Cl. 131-297.000.

Geissler, Klaus H.; and Bock, Herbert, to ANT Nachrichtentechnik GmbH. Transformer for generating high DC voltages with integrated means for cooling rectifiers. 4,558,406, Cl. 363-126.000.

Geist, Michael; and Diefenbach, Horst, to BASF Farben & Fasern AG. Heat-hardenable binder mixture. 4,557,976, Cl. 428-413.000.

Gellert, Jobst U. Heated nozzle for injection molding apparatus. 4,557,685, Cl. 425-549.000.

General American Transportation Corporation: *See*—
Everett, John E., Jr., 4,557,199, Cl. 105-362.000.

General Electric Company: *See*—
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Eckberg, Richard P.; Striker, Richard A.; and Modic, Frank J., 4,558,147, Cl. 556-427.000.
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Pfundt, William N., 4,557,034, Cl. 29-566.400.

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Craig, Gale M., 4,558,259, Cl. 315-82.000.
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Fenton, Frank A.; Booth, Brian; Jones, Stanley P.; and Gennard, Derek, 4,557,744, Cl. 65-29.000.

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Gerlach, Ernst: *See*—
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Giebeler, James F., to Emco Arrowhead. High pressure swivel coupling. 4,557,509, Cl. 285-281.000.

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Gillberg, James E.: *See*—
Dwyer, Robert A.; and Gillberg, James E., 4,558,345, Cl. 357-68.000.

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Plasencia, Armand J.; Tusso, Robert J.; and Gilson, Alan P., 4,558,373, Cl. 358-285.000.

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Orain, Michel A., 4,557,491, Cl. 277-212.0FB.

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af Ekenstam, Bo T.; Glantz, Per-Olof; and Larsson, Kare, 4,557,935, Cl. 424-130.000.

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McDaniel, Robert S., Jr.; Glor, Paul R.; and Kickle, Hunter L., 4,557,729, Cl. 8-111.000.

Glover, David A., to Amway Corporation. Anti-dandruff cream rinse conditioner. 4,557,928, Cl. 424-70.000.

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Kontar, Evgeny A.; Soloviev, Sergei L.; Brovko, Viktor P.; Glukhikh, Rudolf G.; Khomyakov, Evgeny N.; Pakhomov, Jury F.; Khmeljuk, Alexei M.; Vyalykh, Vladimir I.; Zansokhov, Leonid G.; Smertin, Valentin P.; Evseev, Alexei I.; and Sharipov, Fyarit A., 4,557,697, Cl. 441-2.000.

GNB Batteries Inc.: *See*—
Offidani, Ralph V., 4,557,984, Cl. 429-67.000.

Gober, Jerome T., to Imperial Inc. Counterfeit bill warning device. 4,558,224, Cl. 250-461.100.

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Gordon, Eric M.; and Godfrey, Jollie D., Jr., 4,558,150, Cl. 560-16.000.

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Foster, Thomas C.; Goldman, Jon C.; and Hoeye, Gary W., 4,557,950, Cl. 427-255.000.

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Goldman, Saul, to Computer Sign Systems Limited. Computer map. 4,558,300, Cl. 340-286.00M.

Goldwasser, Eugene; Kavinsky, Clifford; and Weiss, Tania L., to University Patents, Inc. Monoclonal anti-erythropoietin. 4,558,005, Cl. 435-7.000.

Golik, Georgy A.; Demchenko, Yaroslav P.; Lozinsky, Miron O.; Malovik, Vladlen V.; and Semeny, Valery Y., to Institut Organicheskoi Khimii. Bis-(N,N-dimethyl-N-carbodecyloxymethyl-N-ethyleneammonium)-sulphide dichloride and use thereof. 4,557,754, Cl. 71-98.000.

Golinsky, Martin, to Grumman Aerospace Corporation. Passive ranging of an airborne emitter by a single sensor. 4,558,323, Cl. 343-458.000.

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Emanuel, Nikolai M.; Rozenberg, Albina N.; Golubev, Valery A.; Bogdanov, Gennady N.; Vasilieva, Ljubov S.; and Konovalova, Nina P., 4,558,127, Cl. 544-310.000.

Gomi, Chikashi; and Hagiwara, Kohichi. Valve seat. 4,557,461, Cl. 251-172.000.

Gonzales, Ervey C. Process of fabricating metal ornaments. 4,557,312, Cl. 164-34.000.

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Goodridge, Francis; Plimley, Raymond E.; and Wright, Allen R., to National Research Development Corporation. Purifying mixed-cation electrolyte. 4,557,812, Cl. 204-130.000.

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Petersen, Don W., 4,557,356, Cl. 188-218.0XL.

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Boon, Wyndham H.; and Henderson, James N., 4,558,096, Cl. 525-166.000.
Philpott, Frank, 4,557,307, Cl. 152-539.000.

Gordon, Eric M.; and Godfrey, Jollie D., Jr., to E. R. Squibb & Sons, Inc. Intermediates for preparing amino thiol dipeptides. 4,558,150, Cl. 560-16.000.

Gordon, Eugene I., to AT&T Bell Laboratories. Semiconductor laser with coupled loss modulator for optical telecommunications. 4,558,449, Cl. 372-44.000.

Gorges, Friedrich J., to Boeing Company, The. Unitary fastener insert for structural sandwich panels. 4,557,100, Cl. 52-787.000.

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Goschl, Peter: *See*—
Krenmayr, Franz; Lichtenegger, Franz; and Goschl, Peter, 4,557,833, Cl. 210-386.000.

Goss, Gary J.; Moles, Robert G. H.; and Hinrichs, Randall D., to Honeywell Information Systems Inc. Digital apparatus for synchronizing a stream of data bits to an internal clock. 4,558,409, Cl. 364-200.000.

Goto, Isamu, to Silver Seiko Limited. Carriage for a hand-operated single bed knitting machine. 4,557,119, Cl. 66-60.00H.

Goto, Shigeru: *See*—
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Goto, Takeshi: *See*—
Imai, Tetsuya; Toyohara, Kenichi; Goto, Takeshi; Murata, Tadateru; Ando, Akihide; Uchida, Toshiro; and Yamamoto, Izuru, 4,557,750, Cl. 71-87.000.

Goto, Yoshiki: *See*—
Ando, Eiji; Goto, Yoshiki; Moriyama, Kumiko; Takeshita, Isao; and Hirao, Kunio, 4,557,850, Cl. 252-68.000.

Gotou, Mineo; Yoshikawa, Ryoichi; Tojo, Toru; and Wada, Hirotsugu, to Tokyo Shibaura Denki Kabushiki Kaisha. Target body position measuring method for charged particle beam fine pattern exposure system. 4,558,225, Cl. 250-491.100.

Gould, Clive M.: *See*—
Callaghan, Ian C.; Fink, Hans-Ferdi; Gould, Clive M.; Koerner, Gotz; Patzke, Hans-Jurgen; and Weitemeyer, Christian, 4,557,737, Cl. 55-87.000.

Grabmaier, Josef: *See*—
Foell, Helmut; Grabmaier, Josef; and Schneider, Juergen, 4,557,793, Cl. 156-608.000.

Graillat, Gerard; and Mabboux, Michel, to Salomon S.A. Alpine ski boot. 4,557,061, Cl. 36-119.000.

Grain Processing Corporation: *See*—
Hubbard, Edward D., 4,558,091, Cl. 524-734.000.
Kightlinger, Adrian P.; and Hubbard, E. Daniel, 4,558,100, Cl. 525-329.100.

Grasselli, Robert K.: *See*—
Tenhover, Michael A.; Henderson, Richard S.; and Grasselli, Robert K., 4,557,766, Cl. 148-11.50P.

Grasser, Hans: *See*—
Meisner, Alfred; Arnold, Werner; Eggebrecht, Frank; and Grasser, Hans, 4,557,606, Cl. 368-204.000.

Grasso's Koniklyke Machine Fabriekon N.V.: *See*—
Van Pelt, Wilhelmus H. J. M., 4,557,741, Cl. 62-541.000.

Gravely, Lawrence E.; Geiss, Vernon L.; and Gregory, Charles F., to Brown & Williamson Tobacco Corporation. Process for reduction of nitrate and nicotine content of tobacco by microbial treatment. 4,557,280, Cl. 131-297.000.

Graves, Daniel F., to Firestone Tire & Rubber Company, The. Carbon black-furazan oxide product and rubber compositions containing same. 4,557,306, Cl. 152-548.000.

Graves, Walter E., Jr., to Varian Associates, Inc. Substrate and substrate holder. 4,558,388, Cl. 360-135.000.

Gray, Dale W.: *See*—
Eastman, Robert E., II; and Gray, Dale W., 4,557,243, Cl. 124-88.000.

Gray, Richard K., to General Motors Corporation. Epoxy bonded rare earth-iron magnets. 4,558,077, Cl. 523-458.000.

Greathouse, Chester K.: *See*—
Gardner, Gary L.; and Greathouse, Chester K., 4,557,303, Cl. 144-145.00A.

Green, David T., to United States Surgical Corporation. Apparatus for applying surgical clips. 4,557,263, Cl. 128-325.000.

Greene, Donald F.; and Urban, Virginia L., to Sterling Drug Inc. Method of disinfecting and sterilizing with hydrogen peroxide compositions. 4,557,898, Cl. 422-28.000.

Greenhalf, Edward J., to Greenwood Moore Limited. Valve testing. 4,557,136, Cl. 73-4.00R.

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Greenhalf, Edward J., 4,557,136, Cl. 73-4.00R.

Greer, Carl R., to General Electric Company. Electrical grounding arrangement and method. 4,557,537, Cl. 339-14.00R.

Gregonis, Donald E.; Stephen, Robert L.; Coleman, Dennis L.; Hunter, Stephen K.; Hanover, Barry K.; and Harrow, Jeffrey J., to University of Utah Research Foundation. Apparatus and methods for minimizing cellular adhesion on peritoneal injection catheters. 4,557,724, Cl. 604-49.000.

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Gravely, Lawrence E.; Geiss, Vernon L.; and Gregory, Charles F., 4,557,280, Cl. 131-297.000.

Gregory, James A.: *See*—
Hanoka, Jack I.; Yates, Douglas A.; and Gregory, James A., 4,557,037, Cl. 29-576.00B.

Greider, C. Austin. Clutch controlled drive unit. 4,557,710, Cl. 474-118.000.

Gressett, Charles A., Jr., to Fender Musical Instruments Corporation. Guitar neck incorporating double-action truss rod apparatus. 4,557,174, Cl. 84-293.000.

Gretsch-Unitas GmbH: *See*—
von Resch, Julius M., 4,557,321, Cl. 165-122.000.

Grigsby, Robert A., Jr.; and Knifton, John F., to Texaco Inc. Process for preparing ethylene glycol and lower monohydric alcohols from syngas using a novel catalyst system. 4,558,072, Cl. 518-701.000.

Gripenholt, Ninneh: *See*—
Berggren, Benny; and Gripenholt, Ninneh, 4,557,775, Cl. 156-96.000.

Grobelny, Damian: *See*—
Galardy, Richard E.; and Grobelny, Damian, 4,558,034, Cl. 514-7.000.

Groeneweg, Adrianus: *See*—
Hensley, Gary L.; Van Dokkum, Jan; Groeneweg, Adrianus; and Stolk, Gerritt, 4,557,142, Cl. 73-153.000.

Grone, Robert J.; Schnell, Leonard R.; and Vearil, Wayne L., to Cincinnati Milacron Inc. Composite tape laying machine and method. 4,557,783, Cl. 156-257.000.

Grosch, James T., to AT&T Bell Laboratories. Current characteristic shaper. 4,558,272, Cl. 323-315.000.

Gross, Hans. Driving mechanism for slat curtains. 4,557,159, Cl. 74-665.0GA.

Grosswendt, Werner: *See*—
Seidensticker, Jens; and Grosswendt, Werner, 4,557,437, Cl. 244-3.210.

Groupement d'Interet Economique dit: Centre International de Recherches Dermatologiques C.I.R.D.: *See*—
Shroot, Braham; Maignan, Jean; and Lang, Gerard, 4,558,069, Cl. 514-473.000.

Groves, William A.: *See*—
Probst, Robert L.; and Groves, William A., 4,557,376, Cl. 206-219.000.

Grumman Aerospace Corporation: *See*—
Golinsky, Martin, 4,558,323, Cl. 343-458.000.

GTE Automatic Electric Incorporated: *See*—
Stahl, Douglas C., 4,558,186, Cl. 179-170.0NC.

GTE Government Systems Corporation: *See*—
Guch, Steve, Jr., 4,558,452, Cl. 372-99.000.

GTE Products Corporation: *See*—
Cribbs, Doyle E.; and Weckerly, James R., 4,557,049, Cl. 30-124.000.
Douglas, Alan D.; Reilly, Kenneth T.; and Landmesser, John E., 4,557,906, Cl. 423-49.000.
Kim, Tai K.; and McClintic, Robert P., 4,557,924, Cl. 423-593.000.
Powers, John A.; and Christini, James N., 4,557,923, Cl. 423-593.000.
Rothwell, Harold L., Jr.; and English, George J., 4,557,700, Cl. 445-53.000.

Guch, Steve, Jr., to GTE Government Systems Corporation. Narrow bandwidth laser apparatus. 4,558,452, Cl. 372-99.000.

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Gueldenzopf, Thomas D.: *See*—
Schulz, Gerald O.; and Gueldenzopf, Thomas D., 4,557,852, Cl. 252-95.000.

Guens, Guy; and Krieger, Karl, to Hermann Hemscheidt Maschinenfabrick GmbH & Co. Arrangement for controlling an electro-hydraulic valve. 4,557,293, Cl. 137-625.650.

Guerin, Yves: *See*—
Besson, Rene ; and Guerin, Yves, 4,558,268, Cl. 318-696.000.

Guevara, Erick: *See*—
Hambleton, Thomas P.; Guevara, Erick; and Rychiger, Peter, 4,557,398, Cl. 220-270.000.

Guibert, Raul. Articulated manual exercise bar. 4,557,479, Cl. 272-122.000.

Guignard, Paul C.; and Ream, Michael D., to Up-Right, Inc. Steering and drive system. 4,557,346, Cl. 180-242.000.

Gulf Research & Development Company: *See*—
Jones, Richard C.; and Powell, John M., 4,558,438, Cl. 367-71.000.
Lopez, Jaime; McKinney, Joel D.; and Pasek, Eugene A., 4,557,821, Cl. 208-108.000.

Gundlach, Gregory E.; and Marshall, Grayson. Three-dimensional photograph. 4,557,954, Cl. 428-29.000.

Gundlach, Robert W.; and Bergen, Richard F., to Xerox Corporation. Self limiting mini-corotron. 4,558,221, Cl. 250-325.000.

Gupta, Arunava; West, Gary A.; and Yardley, James T., to Allied Corporation. Light induced production of ultrafine powders comprising metal silicide powder and silicon. 4,558,017, Cl. 501-96.000.

Gustow, Stanley; Spence, David C.; and Schwartz, William A., to Air Products and Chemicals, Inc. Production of high purity butene-1 from an n-butane feedstock. 4,558,168, Cl. 585-324.000.

Gutierrez, Antonio; Brownawell, Darrell W.; and Bloch, Ricardo, to Exxon Research & Engineering Co. Ethylene copolymer viscosity index improver-dispersant additive useful in oil compositions. 4,557,847, Cl. 252-51.50A.

Gyurovits, John S. Plug type faucet valve. 4,557,464, Cl. 251-287.000.

Ha, Heung Y. Animal trap. 4,557,067, Cl. 43-61.000.

Haas, Laird K. S.: *See*—
Fortino, Placido S.; Haas, Laird K. S.; Hong, Siu-Ping; Lo, Wing C.; and Neupauer, Edward J., 4,558,390, Cl. 361-119.000.

Haas, Roland: *See*—
Brandenstein, Manfred; Haas, Roland; Herrmann, Gerhard; and Hans, Rudiger, 4,557,708, Cl. 474-112.000.

Haase, Harold A. Flat, compact, linear ball bearing with wedge-locked eccentric adjustment and removable races in cylindrical seats. 4,557,530, Cl. 308-6.00C.

Hach Company: *See*—
Schoonover, David J.; and Taylor, Tillman F., Jr., 4,557,899, Cl. 422-55.000.

Hachenberg, Winfried: *See*—
Watermann, Willy; and Hachenberg, Winfried, 4,557,635, Cl. 405-296.000.

Hachiro, Nobuaki: *See*—
Takeuchi, Hiroo; Hachiro, Nobuaki; and Miyazaki, Yoshihisa, 4,557,179, Cl. 91-369.00A.

Hackney, John. Bearing systems for sailcraft gooseneck units. 4,557,212, Cl. 114-98.000.

Hacskaylo, Michael, to United States of America, Army. Distended point source reflector having conical sections. 4,557,569, Cl. 350-630.000.

Hadley, Donald, Jr. Mushroom slicer. 4,557,053, Cl. 30-279.00R.

Haemmerle AG: *See*—
Ragettli, Christian; and Frei, Theo, 4,557,135, Cl. 72-420.000.

Haeno, Akira: *See*—
Aizawa, Koki; Takizawa, Yoshiyuki; Haeno, Akira; and Motoyama, Akira, 4,558,213, Cl. 250-214.00R.

Hagenmaier, Hans-Paul; Werner, Gerhard; Drautz, Hannelore; Holst, Hartwig; Zahner, Hans; Brandes, Wilhelm; Reinecke, Paul; Zobelein, Gerhard; Stendel, Wilhelm; Andrews, Peter; and Schaller, Klaus, to Bayer Aktiengesellschaft. Bafilomycin pesticides. 4,558,139, Cl. 549-271.000.

Hagiwara, Kohichi: *See*—
Gomi, Chikashi; and Hagiwara, Kohichi, 4,557,461, Cl. 251-172.000.

Hagopian, John G.: *See*—
Talbert, Sherwood G.; Flanigan, Lawrence J.; Corliss, John M.; Hagopian, John G.; and Nunheimer, Thomas P., 4,557,253, Cl. 126-429.000.

Hahnke, Manfred; Mohr, Reinhard; and Hohmann, Kurt, to Hoechst Aktiengesellschaft. Process for spin-dyeing of acid-modified polymers of acrylonitrile by the wet-spinning procedure using quaternary ammonium or cyclammonium dyestuffs of low M value and high cation weight having two or three said ammonium or cyclammonium groups. 4,557,732, Cl. 8-538.000.

Hakamada, Haruo: *See*—
Serizawa, Moriyoshi; and Hakamada, Haruo, 4,557,591, Cl. 355-40.000.

Halasa, Adel F.: *See*—
Hergenrother, William L.; and Halasa, Adel F., 4,558,103, Cl. 525-538.000.

Halberschmidt, Friedrich; Audi, Josef; Radermacher, Herbert; and Schwarzenberg, Norbert, to Saint-Gobain Vitrage. Bending of glass sheets on a shaping bed consisting of rotating elements. 4,557,745, Cl. 65-104.000.

Halcon SD Group, Inc., The: *See*—
Brill, William F., 4,558,026, Cl. 502-159.000.

Halextine, Cynthia, personal representative: *See*—
Helda, Robert W., deceased; Halextine, Cynthia, personal representative; and Liaw, H. Ming, 4,557,795, Cl. 156-617.0SP.

Hall, Dennis S.: *See*—
Mansfield, Graham J.; Hall, Dennis S.; and Cameron, Ewen R., 4,557,787, Cl. 156-356.000.

Hall, George R., II, to Babcock & Wilcox Company, The. Temperature-actuated flow control device. 4,557,419, Cl. 236-93.00R.

Halliburton Company: *See*—
Beck, Harold K., 4,557,333, Cl. 166-374.000.
George, Charles; and Gerke, Richard R., 4,557,763, Cl. 106-90.000.

Hamane, Masumi; and Onda, Takanori, to Honda Giken Kogyo Kabushiki Kaisha. Motorcycle engine cooling system. 4,557,345, Cl. 180-229.000.

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Hamill, Donald F.: *See*—
Poirier, Roger; and Hamill, Donald F., 4,557,141, Cl. 73-117.200.

Hammock, Bruce D.; and Ota, Kenji, to University of California, The Regents of the. Monitoring preneoplastic antigen. 4,558,004, Cl. 435-4.000.

Hammond, Milton L.: *See*—
Thompson, Kathryn L.; Zambias, Robert A.; Hammond, Milton L.; and Chang, Michael N., 4,558,067, Cl. 514-458.000.

Hampson, Alfred A., to Can and Bottle Systems, Inc. Container redemption method and apparatus. 4,558,212, Cl. 235-383.000.

Hamura, Masayuki: *See*—
Nakashima, Seiichiro; Torii, Nobutoshi; and Hamura, Masayuki, 4,557,660, Cl. 414-730.000.

Hanayama, Naoki; Kaku, Eisaburo; and Kinishi, Ryoichi, to Yoshitomi Pharmaceutical Industries, Ltd. Thermoresponsive recording sheet. 4,558,335, Cl. 346-209.000.

Hancy, Raymond E. Pounce pad. 4,557,620, Cl. 401-200.000.

Handt, Alan E. Spike exchanger for continuous ambulatory peritoneal dialysis. 4,557,727, Cl. 604-80.000.

Handy, Barry L. Wing section rod weeder with mating coupling components. 4,557,335, Cl. 172-44.000.

Haneda, Hideo; and Yamanaka, Minoru, to Aisin Seiki Kabushiki Kaisha. Solenoid assembly. 4,558,293, Cl. 335-255.000.

Haneda, Satoshi; and Hiratsuka, Seiichiro, to Konishiroku Photo Industry Co., Ltd. Developing method. 4,557,992, Cl. 430-122.000.

Haneishi, Tatsuo; Okazaki, Takao; Torikata, Akio; Nakajima, Mutsuo; Enokita, Ryuzou; Katayama, Toshiaki; and Iwado, Seigo, to Sankyo Company Limited. Antibiotic called "chloropolysporin", a process

for its preparation, and its therapeutic and veterinary use. 4,557,933, Cl. 424-118.000.

Haninger, Rudolf: *See*—
Rutschle, Eugen; Winkler, Hans-Henning; and Haninger, Rudolf, 4,557,035, Cl. 29-568.000.

Hanks, James V.; and Dayen, Leonid, to Horton Manufacturing Co., Inc. Dual-rotary union, rotational isolation adapter. 4,557,506, Cl. 285-39.000.

Hannon, Charles N., to Stepper, Inc. Multi-purpose feeder for successively delivering single sheet or multi-leaved articles from a stack thereof. 4,557,472, Cl. 271-133.000.

Hannum, David A.: *See*—
Nichols, James D.; Derby, Richard; von dem Bussche, Glenn T.; and Hannum, David A., 4,557,838, Cl. 252-8.55C.

Hanoka, Jack I.; Yates, Douglas A.; and Gregory, James A., to Mobil Solar Energy Corporation. Method of fabricating solar cells. 4,557,037, Cl. 29-576.00B.

Hanover, Barry K.: *See*—
Gregonis, Donald E.; Stephen, Robert L.; Coleman, Dennis L.; Hunter, Stephen K.; Hanover, Barry K.; and Harrow, Jeffrey J., 4,557,724, Cl. 604-49.000.

Hans, Rudiger: *See*—
Brandenstein, Manfred; Haas, Roland; Herrmann, Gerhard; and Hans, Rudiger, 4,557,708, Cl. 474-112.000.

Hansson, P. E. Anders: *See*—
Jachimowicz, Felek; and Hansson, P. E. Anders, 4,558,101, Cl. 525-333.200.

Hara, Kazuya: *See*—
Takeuchi, Eiichi; and Hara, Kazuya, 4,558,427, Cl. 364-708.000.

Hara, Masanori; Sugawara, Sakuo; Yamazaki, Kisuke; and Kasagi, Hiroshi, to Mitsubishi Denki Kabushiki Kaisha. Warm-air heating apparatus. 4,557,247, Cl. 126-99.00R.

Haraguchi, Hideaki; and Hata, Shunichi, to Matsushita Electric Works, Ltd. Hair cutter. 4,557,050, Cl. 30-195.000.

Harding, Robert A.: *See*—
Olinger, Dean E.; and Harding, Robert A., 4,557,406, Cl. 222-564.000.

Hardy, Brian E.; and Sealey, Harold D., to Electro-Magic, Inc. Heat exchanger and method of making same. 4,557,323, Cl. 165-163.000.

Hargreaves, Rodney B.; McLoughlin, Bernard J.; and Mills, Stuart D., to Imperial Chemical Industries, PLC. 1,3,4-Thiadiazin-2-ones. 4,558,045, Cl. 514-222.000.

Harmon, Kermit S., Jr. Temperature control systems with programmed dead-band ramp and drift features. 4,557,317, Cl. 165-2.000.

Harriman, Ronald M. Solenoid operated exhaust air damper. 4,557,185, Cl. 98-116.000.

Harris Corporation: *See*—
Mimken, Frederick, 4,558,453, Cl. 375-1.000.

Harris, David H.: *See*—
Paciorek, Kazimiera J. L.; Kratzer, Reinhold H.; Harris, David H.; Smythe, Mark E.; and Nakahara, James H., 4,557,869, Cl. 260-349.000.

Harris, Donald L., to Cordis Corporation. Fill port for an implantable dispensing system. 4,557,722, Cl. 604-9.000.

Harris, Timothy S.; and Harrod, Lawrence R., to Pines of America, Inc. All terrain vehicle toy with dynamic braking. 4,558,263, Cl. 318-139.000.

Harrod, Lawrence R.: *See*—
Harris, Timothy S.; and Harrod, Lawrence R., 4,558,263, Cl. 318-139.000.

Harrow, Jeffrey J.: *See*—
Gregonis, Donald E.; Stephen, Robert L.; Coleman, Dennis L.; Hunter, Stephen K.; Hanover, Barry K.; and Harrow, Jeffrey J., 4,557,724, Cl. 604-49.000.

Harry Hill Associates: *See*—
Sturdevant, Eugene J.; and Daniels, John F., 4,558,208, Cl. 219-399.000.

Harsco Corporation: *See*—
Kulp, Jonathan P., 4,557,367, Cl. 198-313.000.

Hart, James E.; Spalding, Willard P.; and Kyllonen, Allen W., to American Standard Inc. Brake cylinder/air reservoir device. 4,557,181, Cl. 91-519.000.

Harting, Erik: *See*—
Ruck, Nancy C.; Mills, David R.; and Harting, Erik, 4,557,565, Cl. 350-262.000.

Haruff, John J.: *See*—
Meacham, David D.; and Haruff, John J., 4,557,819, Cl. 204-298.000.

Harumoto Iron Works Co., Ltd.: *See*—
Daiguji, Hisashi; and Tanaka, Ikuo, 4,557,007, Cl. 14-22.000.

Hasegawa, Kinji: *See*—
Nouda, Hiroshi; Hasegawa, Kinji; and Hosoi, Masahiro, 4,557,982, Cl. 428-694.000.

Hasegawa, Masumi, to Tokyo Shibaura Denki Kabushiki Kaisha. Valveless lubricant pump for a lateral rotary compressor. 4,557,677, Cl. 418-63.000.

Hasegawa, Shumpei, to Honda Giken Kogyo Kabushiki Kaisha. Air/fuel ratio feedback control system for an internal combustion engine of a vehicle. 4,557,242, Cl. 123-589.000.

Hashiba, Tooru: *See*—
Iizuka, Jiro; Kaneko, Takatoshi; and Hashiba, Tooru, 4,558,330, Cl. 346-76.0PH.

Hashimoto, Shinichi: *See*—
Imai, Kazuo; Niigata, Kunihiro; Fujikura, Takashi; Hashimoto, Shinichi; and Takenaka, Toichi, 4,558,156, Cl. 564-85.000.

Hashimoto, Toyokazu: *See*—
Matsumura, Hisashi; Hashimoto, Toyokazu; Kida, Masahiko; and Wada, Hiroyuki, 4,558,428, Cl. 364-900.000.

Hashimoto, Yutaka, to Toshiba Kikai Kabushiki Kaisha. Multiple control valve system. 4,557,291, Cl. 137-596.130.

Hata, Masahito: *See*—
Yamanashi, Yoshihiro; Okuma, Minoru; Hata, Masahito; and Nishihara, Toshio, 4,557,711, Cl. 474-900.000.

Hata, Shunichi: *See*—
Haraguchi, Hideaki; and Hata, Shunichi, 4,557,050, Cl. 30-195.000.

Hata, Takuoki; Ohmi, Akira; Ushijima, Tadayoshi; and Kuroda, Takayuki, to Matsushita Electric Industrial Co., Ltd. Ceramic high dielectric composition. 4,558,021, Cl. 501-137.000.

Hatanai, Takashi: *See*—
Shimada, Yutaka; Mukasa, Koichi; Hatanai, Takashi; and Nakashima, Keishi, 4,557,769, Cl. 148-31.550.

Hatano, Takayoshi: *See*—
Yokoyama, Yasuyuki; Hatano, Takayoshi; Suzuki, Kenji; and Fujioka, Koichiro, 4,557,592, Cl. 355-51.000.

Hatayama, Katsuo; Yoshikawa, Kensei; Sano, Tatsuhiko; Ohuchi, Yutaka; Ota, Tomomi; Sekiuchi, Kazuto; and Sota, Kaoru, to Taisho Pharmaceutical Co., Ltd. Novel styrene derivatives of the general formula. 4,557,871, Cl. 556-183.000.

Hatch, Bruce O., to Thermal Dynamics Corporation. Plasma-arc torch with gas cooled blow-out electrode. 4,558,201, Cl. 219-121.0PM.

Hatch, Robert P.: *See*—
Buckler, Robert T.; and Hatch, Robert P., 4,558,130, Cl. 546-66.000.

Hattori, Yuji: *See*—
Takahashi, Masaaki; Hattori, Yuji; and Igarashi, Yuriko, 4,557,755, Cl. 71-100.000.

Hatzenbuhler, John R.; and Lindl, Thomas A. Laser barrier. 4,558,093, Cl. 524-837.000.

Hauni-Werke Korber & Co. KG: *See*—
Elsner, Uwe; and Komossa, Werner, 4,557,074, Cl. 51-5.00D.

Hauser, Georg: *See*—
Strobel, Alfons; Wagner, Hans; and Hauser, Georg, 4,557,205, Cl. 112-20.000.

Haussmann, Gerhard; and Kamleitner, Ewald, to MTU Motoren und Turbinen-Union Friedrichshafen GmbH. Control system for the engagement and disengagement of exhaust gas turbochargers. 4,557,111, Cl. 60-600.000.

Hawley, Gil R.: *See*—
Kukes, Simon G.; and Hawley, Gil R., 4,557,824, Cl. 208-251.00H.

Hayashi, Kiyoshi; Hori, Setsuo; Hirata, Nobuyuki; Kobayashi, Kazuhiro; and Mizuno, Masayuki, to Mita Industrial Co., Ltd. Image-forming apparatus. 4,557,586, Cl. 355-11.000.

Hayashi, Yasuhiro: *See*—
Yamagami, Hiroyuki; Hayashi, Yasuhiro; Deguchi, Naoyasu; and Imai, Kiyoshi, 4,558,000, Cl. 430-504.000.

Hayashida, Hiroshi; Takahashi, Tadashi; and Miyashita, Kunio, to Hitachi, Ltd. Method and apparatus for position control of an electric motor. 4,558,265, Cl. 318-561.000.

Haye, Maurice: *See*—
Arnoux, Daniel; Haye, Maurice; and Bonneau, Daniel, 4,557,383, Cl. 206-521.000.

Hayskar, Robert A.: *See*—
Stock, Robert A.; and Hayskar, Robert A., 4,557,786, Cl. 156-350.000.

Health Research, Inc. (Roswell Park Divison): *See*—
Anderson, Garth R.; Manly, Kenneth F.; and Mittelman, Arnold, 4,558,007, Cl. 435-26.000.

Heat Exchanger Industries, Inc.: *See*—
Warner, Donald F., 4,557,202, Cl. 110-216.000.

Heckl, Maria A.: *See*—
Ffowcs Williams, John E.; Dines, Philip J.; and Heckl, Maria A., 4,557,106, Cl. 60-39.281.

Hecock, J. Edwin; and Mumper, James O., to E & J Demark, Inc. Electrical grounding rod driving device. 4,557,409, Cl. 227-147.000.

Heerema, E. P., executor: *See*—
Meek, Jan; Uittenbogaard, Maurice; Michelsen, Finn C.; and Heerema, Pieter S., deceased, 4,557,629, Cl. 405-204.000.

Heerema Engineering Service BV: *See*—
Meek, Jan; Uittenbogaard, Maurice; Michelsen, Finn C.; and Heerema, Pieter S., deceased, 4,557,629, Cl. 405-204.000.

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Meek, Jan; Uittenbogaard, Maurice; Michelsen, Finn C.; and Heerema, Pieter S., deceased, 4,557,629, Cl. 405-204.000.

Hefner, Robert E., Jr., to Dow Chemical Company, The. Thermosettable resin compositions containing a polyepoxide and an alkenyl phenyl cyanate. 4,558,115, Cl. 528-92.000.

Heidelberger Druckmaschinen AG: *See*—
Rodi, Anton; Blasius, Udo; and Uhrig, Dieter, 4,558,216, Cl. 250-223.00R.

Heil, Guenter; Lenz, Werner; and Kovacs, Jenoe, to BASF Aktiengesellschaft. Magnetic recording media. 4,557,813, Cl. 204-159.140.

Heimann, Bernhard, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Wire laying arm. 4,557,428, Cl. 242-82.000.

Heinrich Baumgarten KG Eisen- und Blechwarenfabrik: *See*—
Baumgarten, Gerd D., 4,557,396, Cl. 220-206.000.

Heinrich, Raymond L.: *See*—
Hills, Michael T.; and Heinrich, Raymond L., 4,558,454, Cl. 375-18.000.

Heitmann, Jurgen, to Robert Bosch GmbH. Method and system of reproduction of magnetically recorded video signals at speeds differing from recording speed. 4,558,376, Cl. 360-10.100.

Heitzmann, Harold A., to Cardiovascular Devices, Inc. Optical sensor with beads. 4,557,900, Cl. 422-55.000.

Helbrecht, Otto. Grinding machine for the rims of spectacle lenses. 4,557,076, Cl. 51-165.710.

Held, Kurt. Method and apparatus for manufacturing compressed materials having textured surfaces. 4,557,778, Cl. 156-209.000.

Helda, Robert W., deceased; by Halextine, Cynthia, personal representative; and Liaw, H. Ming, to Motorola, Inc. Melt recharge method. 4,557,795, Cl. 156-617.0SP.

Helset Engineering Company Limited: *See*—
Szczupak, David T., 4,557,665, Cl. 415-158.000.

Hemphill, Allegra D. Vaginal applicator. 4,557,720, Cl. 604-1.000.

Henderson, James N.: *See*—
Boon, Wyndham H.; and Henderson, James N., 4,558,096, Cl. 525-166.000.

Henderson, Richard S.: *See*—
Tenhover, Michael A.; Henderson, Richard S.; and Grasselli, Robert K., 4,557,766, Cl. 148-11.50P.

Hendricks, Richard: *See*—
Maier, Charles, 4,557,213, Cl. 114-106.000.

Hendrickson, Melvin C.; and Sproston, Robert L., Jr., to Zenith Electronics Corporation. Decoder lockout defeat circuit. 4,558,360, Cl. 358-120.000.

Henkel Kommanditgesellschaft auf Aktien: *See*—
Christophliemk, Peter; von Laufenberg, Jurgen; Novotny, Rudolf; Staller, Siegfried; and Diekotter, Friedrich W., 4,557,907, Cl. 423-119.000.
Kluth, Hermann; and Wegner, Jurgen, 4,558,073, Cl. 521-110.000.

Henning, Rainer: *See*—
Urbach, Hansjorg; Henning, Rainer; and Becker, Reinhard, 4,558,065, Cl. 514-412.000.

Henry Ford Hospital: *See*—
Wu, Kent K., 4,557,259, Cl. 128-92.00E.

Hensley, Gary L.; Van Dokkum, Jan; Groeneweg, Adrianus; and Stolk, Gerritt, to Hutchinson-Hayes International, Inc. Apparatus and method for real-time measurement of drilling fluid properties. 4,557,142, Cl. 73-153.000.

Henzl, Jindrich; Kuda, Vladimir; Vasicek, Vladimir; and Klimes, Stanislav, to ZVS Vyzkumnevyvojovy Ustav Koncernova Ucelova Organizace. Method of and apparatus for selectively releasing a predetermined length of weft thread in shuttleless looms. 4,557,299, Cl. 139-452.000.

Hercules Incorporated: *See*—
Desmarais, Armand J., 4,558,079, Cl. 524-43.000.
Gill, Dee R.; Hikida, Edward T.; and Radice, Daniel M., 4,557,422, Cl. 242-1.000.

Herff Jones, Inc.: *See*—
Karamon, Robert J.; and Allen, Robert T., 4,557,895, Cl. 420-587.000.

Hergenrother, William L.; and Halasa, Adel F., to Firestone Tire & Rubber Company, The. Polyphosphazene polymers containing diallyamino substituents. 4,558,103, Cl. 525-538.000.

Hermann Hemscheidt Maschinenfabrick GmbH & Co.: *See*—
Guens, Guy; and Krieger, Karl, 4,557,293, Cl. 137-625.650.

Herrmann, Gerhard: *See*—
Brandenstein, Manfred; Haas, Roland; Herrmann, Gerhard; and Hans, Rudiger, 4,557,708, Cl. 474-112.000.

Hesch, Harold E.; and Przybylinski, Phillip G., to Pullman Standard Inc. Multiplanar support beam for hitch pivot mount. 4,557,647, Cl. 410-58.000.

Hess, Joachim. Low power electrical heating device. 4,558,209, Cl. 219-530.000.

Hesse, Norbert: *See*—
Merten, Gerhard; Breuer, Oswald; Hesse, Norbert; and Steinkuhl, Bernd, 4,557,525, Cl. 299-93.000.

Hesterberg, Eugen, to B.A.T. Cigaretten-Fabriken GmbH. Method and apparatus for attaching a token to a container. 4,557,101, Cl. 53-50.000.

Hettiger, James, to RCA Corporation. Trilevel sandcastle pulse encoder. 4,558,355, Cl. 358-74.000.

Heyne, John A.; and Chamness, Leland D., to Oximetrix, Inc. I. V. Pump cassette. 4,557,725, Cl. 604-67.000.

Hickey, Dennis J., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Safety devices for carrier shells. 4,557,198, Cl. 102-481.000.

Hielm, Odd: *See*—
Vahlberg, Christer; and Hielm, Odd, 4,557,458, Cl. 248-553.000.

Hierman, Thomas L.: *See*—
Stahl, Benedict J.; and Hierman, Thomas L., 4,557,416, Cl. 232-24.000.

Higashine, Seiji: *See*—
Sugisawa, Ko; Yamamoto, Masanori; Shibuki, Masaru; Nomura, Yukihiro; Sengoku, Koji; Higashine, Seiji; and Hioki, Hiroko, 4,557,939, Cl. 426-473.000.

Higginbottom, Harold P.; and Drumm, Manuel F., to Monsanto Company. Process for deposition of resin dispersions on metal substrates. 4,557,979, Cl. 428-460.000.

Hijikigawa, Masaya: *See*—
Tanaka, Junichi; Furubayashi, Hisatoshi; Watanabe, Masanori; and Hijikigawa, Masaya, 4,558,393, Cl. 361-286.000.

Hijiya, Hiromi: *See*—
Miyake, Toshio; Hijiya, Hiromi; Suzuki, Shinji; and Matsumoto, Teruo, 4,557,927, Cl. 424-48.000.

Hikida, Edward T.: *See*—
Gill, Dee R.; Hikida, Edward T.; and Radice, Daniel M., 4,557,422, Cl. 242-1.000.

Hill, Robert A.: *See*—
Wakalopulos, George; Hill, Robert A.; and Peressini, Eugene R., 4,558,450, Cl. 372-87.000.

Hill, Royce W., to Micro Plastics, Inc. Captive panel screw. 4,557,653, Cl. 411-337.000.

Hille, Hans-Dieter: *See*—
Drexler, Hermann-Josef; Ebner, Franz; Hille, Hans-Dieter; and Poth, Ulrich, 4,558,090, Cl. 524-591.000.

Hillen, Kenneth K.: *See*—
DenBeste, Steven C.; Boyce, Douglas G.; Blattner, John D.; and Hillen, Kenneth K., 4,558,422, Cl. 364-480.000.

Hillenbrand, Louis J.: *See*—
Preston, Joseph R.; and Hillenbrand, Louis J., 4,557,807, Cl. 204-4.000.

Hillman, Arthur E.: *See*—
Belmonte, James A.; and Hillman, Arthur E., 4,557,962, Cl. 428-117.000.

Hillman Newby Ltd.: *See*—
Litherland, James A. F., 4,557,488, Cl. 277-27.000.

Hills, Michael T.; and Heinrich, Raymond L., to National Information Utilities Corporation. Digital partial response filter. 4,558,454, Cl. 375-18.000.

Hilton-Davis Chemical Co., The: *See*—
Schmidt, Paul J.; and Hung, William M., 4,558,137, Cl. 548-492.000.

Hines, Stephen P., to Walt Disney Productions. Camera assembly for three-dimensional photography. 4,557,570, Cl. 354-113.000.

Hingley, Colin G.: *See*—
Tallian, Tibor E.; and Hingley, Colin G., 4,557,613, Cl. 384-568.000.

Hinrichs, Randall D.: *See*—
Goss, Gary J.; Moles, Robert G. H.; and Hinrichs, Randall D., 4,558,409, Cl. 364-200.000.

Hinsch, Bernhard, to Ethicon Inc. Surgical filament from polypropylene blended with polyethylene. 4,557,264, Cl. 128-335.500.

Hinshaw, Jay: *See*—
Walworth, Robert S.; Hinshaw, Jay; and LaBotz, Arnold H., 4,557,080, Cl. 52-9.000.

Hioki, Hiroko: *See*—
Sugisawa, Ko; Yamamoto, Masanori; Shibuki, Masaru; Nomura, Yukihiro; Sengoku, Koji; Higashine, Seiji; and Hioki, Hiroko, 4,557,939, Cl. 426-473.000.

Hirabayashi, Yuji: *See*—
Akiyama, Susumu; Ito, Kenzo; Fukaya, Hiroyasu; Ogiso, Haruhiko; Hirabayashi, Yuji; and Kawamura, Takahide, 4,558,417, Cl. 364-431.110.

Hirai, Yutaka: *See*—
Nakagawa, Katsumi; Komatsu, Toshiyuki; Hirai, Yutaka; Misumi, Teruo; and Fukuda, Tadaji, 4,557,990, Cl. 430-84.000.

Hirakata, Yoshiaki: *See*—
Tanaka, Shuji; Nakamura, Shigehira; Sakamoto, Tuneaki; Hirakata, Yoshiaki; and Yamagata, Tetsuo, 4,558,460, Cl. 381-86.000.

Hirano, Hiroyuki: *See*—
Tanaka, Yoshikazu; Yamamuro, Sigeaki; Abo, Keiju; Hirano, Hiroyuki; Kumura, Haruyoshi; and Morimoto, Yoshiro, 4,557,706, Cl. 474-28.000.

Hirao, Hiroshi: *See*—
Suzuki, Yasuo; Hirao, Hiroshi; and Suzuki, Yasuaki, 4,558,241, Cl. 307-530.000.

Hirao, Kunio: *See*—
Ando, Eiji; Goto, Yoshiki; Moriyama, Kumiko; Takeshita, Isao; and Hirao, Kunio, 4,557,850, Cl. 252-68.000.

Hirata, Nobuyuki: *See*—
Hayashi, Kiyoshi; Hori, Setsuo; Hirata, Nobuyuki; Kobayashi, Kazuhiro; and Mizuno, Masayuki, 4,557,586, Cl. 355-11.000.

Hiratsuka, Seiichiro: *See*—
Haneda, Satoshi; and Hiratsuka, Seiichiro, 4,557,992, Cl. 430-122.000.

Hirobe, Hitoshi: *See*—
Urata, Shinji; Hirobe, Hitoshi; and Iketani, Kohei, 4,558,367, Cl. 358-227.000.

Hirosawa, Yasuhisa: *See*—
Nikaido, Akira; Machida, Takayasu; Hirosawa, Yasuhisa; and Nakajima, Fumio, 4,558,244, Cl. 310-49.00R.

Hirose, Takao: *See*—
Ohtsuki, Tomonari; and Hirose, Takao, 4,557,545, Cl. 339-103.00M.

Hirota, Akira, to Victor Company of Japan, Ltd. Circuit for reducing noise in a carrier chrominance signal. 4,558,353, Cl. 358-36.000.

Hirschfeld, Tomas B.; and Block, Myron J., to Block, Myron J. Assay apparatus and methods. 4,558,014, Cl. 436-527.000.

Hisada, Takanori: *See*—
Azumi, Takashi; Maruyama, Takesuke; and Hisada, Takanori, 4,557,567, Cl. 350-427.000.

Hitachi Chemical Company: *See*—
Nakaso, Akishi; Okamura, Toshiro; Yamanoi, Kiyoshi; and Nakajima, Sumiko, 4,557,762, Cl. 106-1.230.

Hitachi, Ltd.: *See*—
Azumi, Takashi; Maruyama, Takesuke; and Hisada, Takanori, 4,557,567, Cl. 350-427.000.
Banba, Fumiyasu; and Ogata, Mikito, 4,558,446, Cl. 371-10.000.
Hayashida, Hiroshi; Takahashi, Tadashi; and Miyashita, Kunio, 4,558,265, Cl. 318-561.000.
Kato, Takashi; Yoshikawa, Tomio; Sato, Keiji; and Yoshioka, Kazuo, 4,557,114, Cl. 62-126.000.

Kitamori, Takehiko; Fujii, Masaaki; and Sawada, Tsuguo. 4,557,137, Cl. 73-24.000.
Komoda, Sei-ichi, 4,557,892, Cl. 376-412.000.
Kuroishi, Tadafumi; and Yasuda, Kazuo, 4,557,601, Cl. 356-320.000.
Matsumura, Hisashi; Hashimoto, Toyokazu; Kida, Masahiko; and Wada, Hiroyuki, 4,558,428, Cl. 364-900.000.
Mori, Hidetomo; Matsushita, Osami; Matsubara, Katsumi; Ida, Michiaki; and Sasaki, Shigeru, 4,557,679, Cl. 418-201.000.
Morikawa, Yuichi; Saito, Kazuo; Amada, Eiichi; and Shirasu, Hirotoshi, 4,558,185, Cl. 179-170.0NC.
Murayama, Akira; Kuno, Hiroaki; Uchikawa, Naoshi; Tamura, Takahiro; Mizuno, Takao; Kotani, Sumihisa; Tomita, Yoshikatsu; Arata, Tetsuya; Shiibayashi, Masao; and Suefuji, Kazutaka, 4,557,675, Cl. 418-55.000.
Ozawa, Toru; and Kinoshita, Hiroshi, 4,557,058, Cl. 34-82.000.
Shibata, Akira; and Ohashi, Shinichi, 4,558,378, Cl. 360-19.100.
Toyama, Tatsuro; and Fujiwara, Masayuki, 4,558,399, Cl. 361-433.000.
Tsuzurabara, Mamoru, 4,558,250, Cl. 313-337.000.
Yamada, Jun, 4,558,364, Cl. 358-188.000.
Yamada, Kazuji; Sato, Hideo; Kitadate, Yukitaka; Kawakami, Kanji; Kato, Kazuo; and Sasayama, Takao, 4,558,238, Cl. 307-491.000.
Yamada, Minoru; Masaki, Akira; Yamamoto, Masakazu; Nakanishi, Keiichirou; Nishida, Takashi; Daikoku, Takahiro; Kobayashi, Fumiyuki; and Imai, Kuninori, 4,558,395, Cl. 361-385.000.
Yamada, Osamu; Murooka, Hideyasu; Ono, Kaoru; and Miyashita, Akimi, 4,557,792, Cl. 156-583.100.
Yamamoto, Etsuji; Sekihara, Kensuke; Kohno, Hideki; and Yamamoto, Shinji, 4,558,425, Cl. 364-555.000.
Yanada, Sadao; Honda, Naganobu; Miyagaki, Hisanori; and Nigawara, Seiitsu, 4,558,227, Cl. 290-40.00R.

Hitachi Medical Corporation: *See*—
Horiba, Isao; and Iwata, Akira, 4,558,462, Cl. 382-42.000.

Hitachi Metals, Ltd.: *See*—
Yamashita, Keitaro, 4,558,294, Cl. 335-303.000.

Hitachi Video Engineering Inc.: *See*—
Shibata, Akira; and Ohashi, Shinichi, 4,558,378, Cl. 360-19.100.

Hizawa, Kouichi: *See*—
Nishida, Hiroshi; Hizawa, Kouichi; and Mine, Taiichi, 4,557,698, Cl. 414-330.000.

Hobbs, James W.: *See*—
Stengle, Nancy K.; and Hobbs, James W., 4,557,806, Cl. 203-1.000.

Hodge, John G., to Boeing Company, The. Fluid container safety valve. 4,557,401, Cl. 222-211.000.

Hodgson, Thomas D., to United Kingdom Atomic Energy Authority. Nuclear fuel cartridge, and a method of preparing the cartridge for the extraction of nuclear material therefrom. 4,557,861, Cl. 252-627.000.

Hodnett, William P., III, to Martin Processing, Inc. Radiation curable coating for film structure. 4,557,980, Cl. 428-336.000.

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Erpenbach, Heinz; Gehrmann, Klaus; Lork, Winfried; and Prinz, Peter, 4,557,760, Cl. 75-121.000.
Hahnke, Manfred; Mohr, Reinhard; and Hohmann, Kurt, 4,557,732, Cl. 8-538.000.
Pistorius, Rudolf, 4,557,873, Cl. 260-513.00R.
Reinecke, Rolf; Rinno, Helmut; and Schultz, Gerhart, 4,558,092, Cl. 524-817.000.
Teetz, Volker; Urbach, Hanajorg; and Becker, Reinhard, 4,558,064, Cl. 514-409.000.
Urbach, Hansjorg; Henning, Rainer; and Becker, Reinhard, 4,558,065, Cl. 514-412.000.
Walch, Axel; Seifried, Walter; Michel, Wolfgang; Kuhls, Jurgen; and Wildhardt, Jurgen, 4,557,955, Cl. 428-35.000.

Hoechst-Roussel Pharmaceuticals Inc.: *See*—
Strupczewski, Joseph T., 4,558,056, Cl. 514-321.000.

Hoegermeyer, Carl L.: *See*—
Cushman, Robert H.; and Hoegermeyer, Carl L., 4,557,514, Cl. 294-64.100.

Hoehn, Marvin M.: *See*—
Boeck, LaVerne D.; Marconi, Gary G.; and Hoehn, Marvin M., 4,558,008, Cl. 435-75.000.
Boeck, LaVerne D.; Hoehn, Marvin M.; and Marconi, Gary G., 4,558,009, Cl. 435-75.000.

Hoeye, Gary W.: *See*—
Foster, Thomas C.; Goldman, Jon C.; and Hoeye, Gary W., 4,557,950, Cl. 427-255.000.

Hoffmann-La Roche Inc.: *See*—
Coffen, David L.; Holland, George W.; Mandeville, W. Harry; Rosen, Perry; and Wong, Frederick, 4,558,140, Cl. 549-312.000.
Holland, George W.; Rosen, Perry; and Maag, Hans, 4,558,142, Cl. 549-465.000.

Hofstetter, Josef, to Sulzer Brothers Limited. Liquid distributor for an exchange column. 4,557,877, Cl. 261-97.000.

Hogan, Robert J.: *See*—
Kukes, Simon G.; Hogan, Robert J.; and Coombs, Daniel M., 4,557,823, Cl. 208-216.00R.

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Hahnke, Manfred; Mohr, Reinhard; and Hohmann, Kurt, 4,557,732, Cl. 8-538.000.

Holden, Chester D.; and Rood, Allan J., to International Business Machines Corporation. Stapler mechanism powering means. 4,557,410, Cl. 227-155.000.

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Holland, George W.: *See*—
Coffen, David L.; Holland, George W.; Mandeville, W. Harry; Rosen, Perry; and Wong, Frederick, 4,558,140, Cl. 549-312.000.

Hollenstein, Helmut: *See*—
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Hollister, Kenneth R.: *See*—
Washburn, William N.; and Hollister, Kenneth R., 4,557,998, Cl. 430-367.000.

Holmes, Allen B., to United States of America, Army. Fluidic mud pulse telemetry transmitter. 4,557,295, Cl. 137-813.000.

Holst, Hartwig: *See*—
Hagenmaier, Hans-Paul; Werner, Gerhard; Drautz, Hannelore; Holst, Hartwig; Zahner, Hans; Brandes, Wilhelm; Reinecke, Paul; Zoebelein, Gerhard; Stendel, Wilhelm; Andrews, Peter; and Schaller, Klaus, 4,558,139, Cl. 549-271.000.

Holstedt, Richard A.; and Jessup, Peter J., to Union Oil Company of California. Boron-containing heterocyclic compounds and lubricating compositions containing the same. 4,557,843, Cl. 252-46.400.

Holtrop, James S.; and Maurer, Richard P., to Monsanto Company. Laminate structure with improved acoustical absorption. 4,557,970, Cl. 428-316.600.

Holzer, Walter: *See*—
Furst, Leander; and Holzer, Walter, 4,557,811, Cl. 204-105.00R.

Holzner, Peter; and Sedlmeier, Werner, to Siemens Aktiengesellschaft. Microcomputer system for high-speed location of blocks of characteristics. 4,558,410, Cl. 364-200.000.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Hamane, Masumi; and Onda, Takanori, 4,557,345, Cl. 180-229.000.
Hasegawa, Shumpei, 4,557,242, Cl. 123-589.000.
Kawasaki, Kazuhiro; and Muranaka, Akio, 4,556,994, Cl. 2-424.000.
Motoki, Kenichi; and Ushiroyama, Nobuyasu, 4,557,671, Cl. 417-328.000.
Sano, Shoichi; and Fufukawa, Yoshimi, 4,557,493, Cl. 280-91.000.
Shimizu, Yasuo, 4,557,705, Cl. 474-13.000.
Tanaka, Shuji; Nakamura, Shigehira; Sakamoto, Tuneaki; Hirakata, Yoshiaki; and Yamagata, Tetsuo, 4,558,460, Cl. 381-86.000.

Honda, Naganobu: *See*—
Yanada, Sadao; Honda, Naganobu; Miyagaki, Hisanori; and Nigawara, Seiitsu, 4,558,227, Cl. 290-40.00R.

Honda, Sigemichi, to Sony Corporation. Ink carrier ribbon for sublimation transfer. 4,558,329, Cl. 346-76.0PH.

Honeywell Inc.: *See*—
Adkisson, William M., 4,558,331, Cl. 346-76.0PH.
Black, Robert A., Jr.; Clark, Rodney L.; Kidder, Kenneth B.; and Patton, Paul B., 4,558,389, Cl. 361-88.000.
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Honeywell Information Systems Inc.: *See*—
Barlow, George J.; Nibby, Chester M., Jr.; and Johnson, Robert B., 4,558,429, Cl. 364-900.000.
Goss, Gary J.; Moles, Robert G. H.; and Hinrichs, Randall D., 4,558,409, Cl. 364-200.000.
Inoshita, Minoru; and Winfrey, Gerald N., 4,558,412, Cl. 364-200.000.

Hong, Siu-Ping: *See*—
Fortino, Placido S.; Haas, Laird K. S.; Hong, Siu-Ping; Lo, Wing C.; and Neupauer, Edward J., 4,558,390, Cl. 361-119.000.

Hoogovens Groep B.V.: *See*—
Commandeur, Jacobus J.; Felthuis, Jacob; and Mantel, Piet, 4,557,507, Cl. 285-45.000.

Hoopengardner, Merle R., to Jac Tac, Inc. System for holding carpet in place without stretching. 4,557,774, Cl. 156-71.000.

Hooven, Michael D., to Cordis Corporation. Servo valve. 4,557,721, Cl. 604-9.000.

Hoppie, Lyle O., to Eaton Corporation. Elastomeric member and method of manufacture therefor. 4,557,781, Cl. 156-245.000.

Hori, Setsuo: *See*—
Hayashi, Kiyoshi; Hori, Setsuo; Hirata, Nobuyuki; Kobayashi, Kazuhiro; and Mizuno, Masayuki, 4,557,586, Cl. 355-11.000.

Horiba, Isao; and Iwata, Akira, to Hitachi Medical Corporation. Apparatus for correcting image distortions automatically by inter-image processing. 4,558,462, Cl. 382-42.000.

Horie, Kiyoshi: *See*—
Saitoh, Koichi; Horie, Kiyoshi; Itami, Teruhiko; and Kimoto, Toshifumu, 4,558,327, Cl. 346-74.200.

Horie, Seiji; Kawamura, Kouichi; Makino, Naonori; and Sato, Hideo, to Fuji Photo Film Co., Ltd. Disazo compounds, photoconductive compositions and electrophotographic light-sensitive materials containing the same. 4,557,988, Cl. 430-58.000.

Horodysky, Andrew G., to Mobil Oil Corporation. Aminated boron- and phosphorus-containing compounds and lubricant or fuel compositions containing same. 4,557,844, Cl. 252-49.900.

Horodysky, Andrew G.; and Landis, Phillip S., to Mobil Oil Corporation. Alkoxylated amine-phosphite reaction product and lubricant and fuel containing same. 4,557,845, Cl. 252-49.900.

Horton Manufacturing Co., Inc.: *See*—
Hanks, James V.; and Dayen, Leonid, 4,557,506, Cl. 285-39.000.

Hosoi, Masahiro: *See*—
Nouda, Hiroshi; Hasegawa, Kinji; and Hosoi, Masahiro, 4,557,982, Cl. 428-694.000.

Hoss, Bradley J.: *See*—
Newsome, David L.; Rein, Arnold R.; Hoss, Bradley J.; and Schroeder, George O., 4,557,780, Cl. 156-244.110.

Hougen, Everett D. Annular cutter. 4,557,641, Cl. 408-204.000.

House Food Industrial Co. Ltd.: *See—*
Sugisawa, Ko; Yamamoto, Masanori; Shibuki, Masaru; Nomura, Yukihiro; Sengoku, Koji; Higashine, Seiji; and Hioki, Hiroko, 4,557,939, Cl. 426-473.000.
Hovde, Oskar. Wall boardings. 4,557,096, Cl. 52-595.000.
Hsieh, Peter K., to RCA Corporation. Memory system. 4,558,435, Cl. 365-203.000.
Huang, Chiung-Yuan: *See—*
Riegel, Herbert; Huang, Chiung-Yuan; and Strangio, Vincent A., 4,558,167, Cl. 570-238.000.
Hubbard, E. Daniel: *See—*
Kightlinger, Adrian P.; and Hubbard, E. Daniel, 4,558,100, Cl. 525-329.100.
Hubbard, Edward D., to Grain Processing Corporation. Method for preparing aluminum and polyhydric alcohol modified liquid absorbing composition. 4,558,091, Cl. 524-734.000.
Hufken, Kurt: *See—*
Probst, Karl; and Hufken, Kurt, 4,557,421, Cl. 241-73.000.
Hughes Microelectronics Limited: *See—*
Edwards, Colin W.; and Murray, Kenelm G. D., 4,558,432, Cl. 365-154.000.
Hughes, Richard H.: *See—*
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Hughes, Ronald H.: *See—*
Kotliar, Abraham M.; Sibilia, John P.; Hughes, Ronald H.; and Landy, Richard A., 4,558,019, Cl. 501-101.000.
Hughes Tool Company: *See—*
Falknor, Charles L.; Vetter, Vincent H.; Wolfer, Dale R.; and Lyon, Dalton K., 4,557,339, Cl. 175-325.000.
Hung, Paul P.; Lee, Shaw-Guang; Roychoudhury, Ranajit; and Ratzkin, Barry J., to Abbott Laboratories. Recombinant deoxyribonucleic acid which codes for plasminogen activator and method of making plasminogen activator protein therefrom. 4,558,010, Cl. 435-212.000.
Hung, William M.: *See—*
Schmidt, Paul J.; and Hung, William M., 4,558,137, Cl. 548-492.000.
Hunnicutt, Wayne E.: *See—*
Jahnke, Richard P.; Keuper, James C.; and Hunnicutt, Wayne E., 4,557,625, Cl. 404-25.000.
Hunter, Stephen K.: *See—*
Gregonis, Donald E.; Stephen, Robert L.; Coleman, Dennis L.; Hunter, Stephen K.; Hanover, Barry K.; and Harrow, Jeffrey J., 4,557,724, Cl. 604-49.000.
Hutchinson-Hayes International, Inc.: *See—*
Hensley, Gary L.; Van Dokkum, Jan; Groeneweg, Adrianus; and Stolk, Gerritt, 4,557,142, Cl. 73-153.000.
Huth, Joseph F., III: *See—*
Olmsted, Robert W.; and Huth, Joseph F., III, 4,558,295, Cl. 336-83.000.
Huttenes-Albertus Chemische Werke GmbH: *See—*
Torbus, Marek, 4,558,074, Cl. 523-142.000.
Hutter, Helmut; and Maier, Heinz, to Siemens Aktiengesellschaft. Disturbance detection and recording system. 4,558,379, Cl. 360-32.000.
Hwang, Blake. Combined combination and key-type lock. 4,557,122, Cl. 70-312.000.
Hwang, Jennie S., to SCM Corporation. Fusible powdered metal paste. 4,557,767, Cl. 148-23.000.
Hydro, William R. Production of dichloroformoxime. 4,558,160, Cl. 564-261.000.
Hydrostress AG: *See—*
Bieri, Hans, 4,557,245, Cl. 125-14.000.
Hyman, Myles; Sheehan, Ronald T.; and Rowland-Hill, E. William, to Sperry Corporation. Four way leveling mechanism for combine cleaning apparatus. 4,557,276, Cl. 130-27.0AE.
I Corp.: *See—*
St. John, Richard C., 4,557,709, Cl. 474-117.000.
Ichikawa, Koji, to Fuji Photo Film Co., Ltd. Problem-cartridge film processing method. 4,557,425, Cl. 242-55.000.
Ida, Michiaki: *See—*
Mori, Hidetomo; Matsushita, Osami; Matsubara, Katsumi; Ida, Michiaki; and Sasaki, Shigeru, 4,557,679, Cl. 418-201.000.
Ide, Satoshi: *See—*
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Ife, Robert J.: *See—*
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Igarashi, Yuriko: *See—*
Takahashi, Masaaki; Hattori, Yuji; and Igarashi, Yuriko, 4,557,755, Cl. 71-100.000.
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IHC Holland N.V.: *See—*
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Iijima, Hiromichi: *See—*
Okamoto, Miyoshi; Iijima, Hiromichi; and Miyoshi, Akito, 4,557,972, Cl. 428-373.000.
Iizuka, Jiro; Kaneko, Takatoshi; and Hashiba, Tooru, to Victor Company of Japan, Ltd. Thermal printing head. 4,558,330, Cl. 346-76.0PH.
Iizuka, Michio: *See—*
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Ikai, Takashi: *See—*
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Ikeda, Masami: *See—*
Sugitani, Hiroshi; Matsuda, Hiroto; and Ikeda, Masami, 4,558,333, Cl. 346-140.00R.
Ikemoto, Shigeru. Hand wrapping apparatus. 4,557,102, Cl. 53-66.000.
Iketani, Kohei: *See—*
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Illinois Tool Works, Inc.: *See—*
Peterson, Francis C., 4,557,651, Cl. 411-181.000.
Weaver, William N.; and Olsen, Robert C., 4,557,375, Cl. 206-151.000.
Imada, Isuke: *See—*
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Imaeda, Kozo: *See—*
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Imai, Kazuo; Niigata, Kunihiro; Fujikura, Takashi; Hashimoto, Shinichi; and Takenaka, Toichi, to Yamanouchi Pharmaceutical Co., Ltd. Sulfamoyl-substituted phenethylamine derivatives. 4,558,156, Cl. 564-85.000.
Imai, Kiyoshi: *See—*
Yamagami, Hiroyuki; Hayashi, Yasuhiro; Deguchi, Naoyasu; and Imai, Kiyoshi, 4,558,000, Cl. 430-504.000.
Imai, Kuninori: *See—*
Yamada, Minoru; Masaki, Akira; Yamamoto, Masakazu; Nakanishi, Keiichirou; Nishida, Takashi; Daikoku, Takahiro; Kobayashi, Fumiyuki; and Imai, Kuninori, 4,558,395, Cl. 361-385.000.
Imai, Tetsuya; Toyohara, Kenichi; Goto, Takeshi; Murata, Tadateru; Ando, Akihide; Uchida, Toshiro; and Yamamoto, Izuru, to Otsuka Kagaku Yakuhin Kabushiki Kaisha. Sulfinamide derivatives, a process for preparing the derivatives and herbicides containing the same. 4,557,750, Cl. 71-87.000.
Immaru, Daisaku: *See—*
Kawasaki, Takao; Immaru, Daisaku; Tsuchiya, Tadashi; Yamaguchi, Yukiharu; and Komatsu, Katsumi, 4,558,059, Cl. 514-371.000.
Imperial Chemical Industries, PLC: *See—*
Hargreaves, Rodney B.; McLoughlin, Bernard J.; and Mills, Stuart D., 4,558,045, Cl. 514-222.000.
Scott, Graham W.; and Steven, James H., 4,557,815, Cl. 204-182.200.
Imperial Inc.: *See—*
Gober, Jerome T., 4,558,224, Cl. 250-461.100.
Imperial Oil Limited: *See—*
Berstein, Patrick, 4,558,211, Cl. 235-380.000.
In-Door Gym: *See—*
Dudley, Edmond R., 4,557,480, Cl. 272-133.000.
In-Situ, Inc.: *See—*
McGrew, Kent J.; and Murphy, Jack W., 4,557,759, Cl. 75-118.00R.
Inaba, Michihiko: *See—*
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Inaba, Naomi: *See—*
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Inagaki, Mitsuo; Ito, Seitoku; Takeda, Kenji; and Kurokawa, Yoshiki, to Nippon Soken, Inc.; and Nippondenso Co. Ltd. Compressor. 4,557,670, Cl. 417-299.000.
INCO Selective Surfaces, Inc.: *See—*
Jatkar, Arun D.; Varall, Alfred J., Jr.; and Schelleng, Robert D., 4,557,893, Cl. 419-12.000.
Ingham, Gary G. Workpiece saw cutoff length measuring device. 4,557,170, Cl. 83-468.000.
Ingram, Gary L.; and Slattery, Ian, to Spencer Wright Industries, Inc. Method and apparatus for tufting patterned fabric. 4,557,208, Cl. 112-266.200.
Innova AB: *See—*
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Inoshita, Minoru; and Winfrey, Gerald N., to Honeywell Information Systems Inc. Direct memory access revolving priority apparatus. 4,558,412, Cl. 364-200.000.
Inoue, Eiichi: *See—*
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Inoue, Takayuki: *See—*
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Inoue, Tetsuo: *See—*
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Institut Francais du Petrole: *See—*
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Kontar, Evgeny A.; Soloviev, Sergei L.; Brovko, Viktor P.; Glukhikh, Rudolf G.; Khomyakov, Evgeny N.; Pakhomov, Jury F.; Khmeljuk, Alexei M.; Vyalykh, Vladimir I.; Zansokhov, Leonid

G.; Smertin, Valentin P.; Evseev, Alexei I.; and Sharipov, Fyarit A., 4,557,697, Cl. 441-2.000.
Institut Organicheskoi Khimii: *See*—
Golik, Georgy A.; Demchenko, Yaroslav P.; Lozinsky, Miron O.; Malovik, Vladlen V.; and Semeny, Valery Y., 4,557,754, Cl. 71-98.000.
Interlake, Inc.: *See*—
Johnson, Robert A., 4,557,427, Cl. 242-55.000.
InterMetro Industries Corp.: *See*—
Cohn, Robert J.; and Chapko, John J., 4,557,511, Cl. 292-218.000.
Intermountain Research & Development Corporation: *See*—
Meadow, Morton, 4,557,910, Cl. 423-206.00T.
International Business Machines Corporation: *See*—
Bernstein, Kerry, 4,558,433, Cl. 365-189.000.
Broers, Alec N.; and Laibowitz, Robert B., 4,557,995, Cl. 430-296.000.
Dollenmayer, William L., 4,557,192, Cl. 101-93.480.
Dove, Derek B.; Makowka, Claus D.; and Street, Ramon L., 4,557,616, Cl. 400-120.000.
Druschke, Frank; Kraus, Georg; Kuenzel, Ulrich; Ruh, Wolf D.; and Schaefer, Rolf, 4,557,796, Cl. 156-643.000.
Epenoy, Gabriel; and Kuhne, Roland, 4,558,455, Cl. 375-112.000.
Freeman, Joseph W.; Kraft, Wayne R.; Kurtz, Hobart L.; and Magrisso, Israel B., 4,558,447, Cl. 371-71.000.
Garwin, Richard L.; and Levine, James L., 4,558,313, Cl. 340-709.000.
Holden, Chester D.; and Rood, Allan J., 4,557,410, Cl. 227-155.000.
Johnson, Mark, 4,558,383, Cl. 360-77.000.
Mitchell, Joan L.; and Pennebaker, William B., 4,558,370, Cl. 358-260.000.
International Computers Limited: *See*—
Drake, John A., 4,557,436, Cl. 242-47.500.
International Flavors & Fragrances Inc.: *See*—
Pittet, Alan O.; Muralidhara, Ranya; and Vock, Manfred H., 4,557,941, Cl. 426-535.000.
International Paper Company: *See*—
Hambleton, Thomas P.; Guevara, Erick; and Rychiger, Peter, 4,557,398, Cl. 220-270.000.
International Playtex, Inc.: *See*—
Cole, Raymond C., 4,557,267, Cl. 128-464.000.
International Standard Electric Corporation: *See*—
Glasauer, Rudolf; and Feigel, Josef, 4,558,245, Cl. 310-67.00R.
International Telephone and Telegraph Corporation: *See*—
Kenney, Malachi P.; Young, Kenneth P.; and Koch, Alan A., 4,557,605, Cl. 366-134.000.
Inuzuka, Tsuneki: *See*—
Komiya, Yutaka; Murakami, Katsumi; Inuzuka, Tsuneki; and Sakamaki, Hisashi, 4,557,587, Cl. 355-14.00C.
Iowa State University Research Foundation, Inc.: *See*—
Rohde, John R.; and Pitt, John M., 4,557,147, Cl. 73-784.000.
Irie, Reiko F.; Tai, Tadashi; Morton, Donald L.; Cahan, Leslie D.; and Paulson, James C., to University of California, Regents of the. Antigenic compositions and methods for using same. 4,557,931, Cl. 424-88.000.
Isaka, Akihiko, to Kabushiki Kaisha Sankyo Seiki Seisakusho. Music box. 4,557,173, Cl. 84-95.00R.
Ishida, Hiroshi; Fujioka, Yoshiki; and Ota, Naoto, to Fanuc Ltd. Induction motor drive apparatus. 4,558,269, Cl. 318-811.000.
Ishida, Matsuhiko; Asano, Masaru; Goto, Shigeru; and Sakurai, Takeshi, to Mitsubishi Denki Kabushiki Kaisha. Moving staircase. 4,557,369, Cl. 198-333.000.
Ishida, Noboru: *See*—
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Ishidoshiro, Hiroshi: *See*—
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Ishikawa, Nobuo; and Kitazume, Tomoya, to Daikin Industries Ltd. Fluorinated allylic compounds and a process for preparing these compounds. 4,558,143, Cl. 556-488.000.
Ishimura, Koichi: *See*—
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Isikawa, Yasuo, to Tachikawa Spring Co., Ltd. Vehicle seat. 4,557,522, Cl. 297-452.000.
Iso, Tadashi: *See*—
Iwao, Jun-ichi; Iso, Tadashi; and Oya, Masayuki, 4,558,125, Cl. 544-135.000.
Itakura, Gen; Kuramitsu, Hideki; Iguchi, Takashi; Kuroda, Takayuki; and Nagase, Kaneomi, to Matsushita Electric Industrial Co., Ltd. Ceramic high dielectric composition. 4,558,020, Cl. 501-137.000.
Itami, Teruhiko: *See*—
Saitoh, Koichi; Horie, Kiyoshi; Itami, Teruhiko; and Kimoto, Toshifumu, 4,558,327, Cl. 346-74.200.
Ito, Kenzo: *See*—
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Ito, Masaya; Mori, Seiji; and Ishida, Noboru, to NGK Spark Plug Co., Ltd. Junction structure of turbine shaft. 4,557,704, Cl. 464-181.000.
Ito, Ryoichi. Stroke apparatus. 4,557,432, Cl. 242-158.00R.
Ito, Seitoku: *See*—
Inagaki, Mitsuo; Ito, Seitoku; Takeda, Kenji; and Kurokawa, Yoshiki, 4,557,670, Cl. 417-299.000.
Ito, Toshimitsu, to Toyota Jidosha Kabushiki Kaisha. Method and system for controlling idle speed in an internal combustion engine. 4,557,234, Cl. 123-339.000.
Ivashina, Evgeny N.: *See*—
Mizin, Vladimir G.; Zubarev, Alexei G.; Kolganov, Gennady S.; Volkov, Stanislav S.; Rudnev, Jury A.; Ivashina, Evgeny N.; Blinov, Konstantin A.; and Jugov, Petr I., 4,557,758, Cl. 75-51.200.
Ive, John G. S.: *See*—
Collins, Mark C.; and Ive, John G. S., 4,558,377, Cl. 360-10.100.
Iwado, Seigo: *See*—
Haneishi, Tatsuo; Okazaki, Takao; Torikata, Akio; Nakajima, Mutsuo; Enokita, Ryuzou; Katayama, Toshiaki; and Iwado, Seigo, 4,557,933, Cl. 424-118.000.
Iwama, Takasuke, to Musashi Engineering Kabushiki Kaisha. Method of discriminating between the front and back sides of paper sheets. 4,557,597, Cl. 356-71.000.
Iwanade, Hisao, to Asahi Kogaku Kogyo Kabushiki Kaisha. Focus and magnification determining and control device for variable magnification type copying machine. 4,557,593, Cl. 355-57.000.
Iwao, Jun-ichi; Iso, Tadashi; and Oya, Masayuki, to Santen Pharmaceutical Co., Ltd. Benzothiazoline compounds which contain a carbonyl group useful for treating cardiovascular disease. 4,558,125, Cl. 544-135.000.
Iwasaki, Masayuki; and Umehara, Akira, to Fuji Photo Film Co., Ltd. Photo-polymerizable process of image formation using unsaturated materials and silver halide. 4,557,997, Cl. 430-325.000.
Iwasaki Tsushinki Kabushiki Kaisha: *See*—
Shinohara, Masaru; Ueno, Makoto; and Sakata, Tsunetaka, 4,558,369, Cl. 358-257.000.
Iwase, Hideo, to Prince Mishin Kabushiki Kaisha. Sewing machine for quilts and the like. 4,557,206, Cl. 112-121.140.
Iwasita, Hiroshi: *See*—
Masuda, Makoto; Iwasita, Hiroshi; and Kuwabara, Toshihiko, 4,557,654, Cl. 411-431.000.
Iwata, Akira: *See*—
Horiba, Isao; and Iwata, Akira, 4,558,462, Cl. 382-42.000.
Iwata, Masahiro; Miyashita, Yushi; and Taka, Yuichi, to Pentel Kabushiki Kaisha. Ink and eraser of the ink. 4,557,618, Cl. 401-34.000.
Iwata, Toyotaro; Nakajima, Kunio; and Otsuki, Hiroyuki, to Toa Medical Electronic Co., Ltd. Shock absorbing mechanism in automatic analyzing and measuring apparatus. 4,557,154, Cl. 74-89.210.
Iwatsu Electric Co., Ltd.: *See*—
Yokoyama, Yasuyuki; Hatano, Takayoshi; Suzuki, Kenji; and Fujioka, Koichiro, 4,557,592, Cl. 355-51.000.
Iwatsuki, Shouji, to Daikin Kogyo Company Limited. Fluoroacrylic compounds. 4,558,152, Cl. 560-219.000.
Iyota, Yasumasa: *See*—
Komiyama, Choji; Oishi, Kengo; Suzuki, Osamu; and Iyota, Yasumasa, 4,557,380, Cl. 206-387.000.
J. C. Kinley Company: *See*—
Kinley, Karl S.; and Pratt, Allyn R., 4,557,327, Cl. 166-241.000.
J. I. Case Company: *See*—
Brown, Marvin L.; and Jarrett, Ronald T., 4,557,448, Cl. 248-75.000.
J. M. Huber Corporation: *See*—
Withiam, Michael C., 4,557,916, Cl. 423-328.000.
J. Strobel & Sohne GmbH & Co.: *See*—
Strobel, Alfons; Wagner, Hans; and Hauser, Georg, 4,557,205, Cl. 112-20.000.
JAC Creative Foods, Inc.: *See*—
Suzuki, Teisuke, 4,557,940, Cl. 426-513.000.
Jac Tac, Inc.: *See*—
Hoopengardner, Merle R., 4,557,774, Cl. 156-71.000.
Jachimowicz, Felek; and Hansson, P. E. Anders, to W. R. Grace & Co. Process for the preparation of polymeric amine containing products. 4,558,101, Cl. 525-333.200.
Jack, Douglas S.; and Sarrett, Homer J., Jr., deceased (by Sarrett, Vivian, Administratrix), to Phillips Petroleum Company. Continuous process for overbasing petroleum sulfonate in a pipe reactor with multiple entry of countercurrent carbon dioxide. 4,557,840, Cl. 252-33.200.
Jackson, L. Robert; and Taylor, Allan H., to United States of America, National Aeronautics and Space Administration. Aerospace vehicle. 4,557,444, Cl. 244-172.000.
Jackson, Norman L.: *See*—
Olson, Donald M.; Jackson, Norman L.; and Tong, Jerry E., 4,557,657, Cl. 414-180.000.
JAEGER: *See*—
Bezard, Jean-Jacques; Jourdain, Charles H.; and Lalanne, Bruno, 4,558,456, Cl. 377-25.000.
Jahnke, Richard P.; Keuper, James C.; and Hunnicutt, Wayne E. Internal sealing assembly. 4,557,625, Cl. 404-25.000.
Jain, Gyan P., to Phillips Petroleum Company. Utilization of an ASTM end point temperature for controlling a fractional distillation process. 4,558,423, Cl. 364-501.000.
James, Barry K., to Dresser Industries, Inc. Electrostatic precipitators. 4,558,404, Cl. 363-37.000.
James River Corporation: *See*—
Kinsley, Homan B., Jr., 4,557,800, Cl. 162-20.000.
Janicki, Piotr: *See*—
Brzosko, Witold; Janicki, Piotr; Laskowski, Zbigniew; Madalinski, Kazimierz; and Dabrowa, Andrzej, 4,558,011, Cl. 435-272.000.
Jannemann, Theo; and Brunje, Horst, to Ruhrgas Aktiengesellschaft. Gas apparatus for producing hot water. 4,557,220, Cl. 122-20.00B.

Japan Tobacco & Salt Public Corporation, The: *See—*
Nishida, Hiroshi; Hizawa, Kouichi; and Mine, Taiichi, 4,557,698, Cl. 414-330.000.

Japanese National Railways: *See—*
Kitta, Toshiyuki; and Abe, Wataru, 4,557,087, Cl. 52-230.000.

Jarrett, Ronald T.: *See—*
Brown, Marvin L.; and Jarrett, Ronald T., 4,557,448, Cl. 248-75.000.

Jastrzebski, Lubomir L.: *See—*
McGinn, Joseph T.; Jastrzebski, Lubomir L.; and Corboy, John F., Jr., 4,557,794, Cl. 156-612.000.

Jatkar, Arun D.; Varall, Alfred J., Jr.; and Schelleng, Robert D., to INCO Selective Surfaces, Inc. Process for producing composite material by milling the metal to 50% saturation hardness then co-milling with the hard phase. 4,557,893, Cl. 419-12.000.

Jauch, Kurt. Automatic multiple workpiece turning machine. 4,557,166, Cl. 82-3.000.

Jeal, Harvey P., to Avdel Limited. Anchor nut fastener device. 4,557,649, Cl. 411-40.000.

Jeglitzka, Maximilian; and von der Ohe, Manfred, to Daimler-Benz Aktiengesellschaft. Wheel suspension system. 4,557,469, Cl. 267-20.00A.

Jernberg, Robert H., to Pressure Pak, Inc. Method of and apparatus for filling pressurized fluid containers. 4,557,300, Cl. 141-5.000.

Jessup, Peter J.: *See—*
Holstedt, Richard A.; and Jessup, Peter J., 4,557,843, Cl. 252-46.400.

Jeweler's Safe Company, Inc.: *See—*
Webb, James V., Jr., 4,557,201, Cl. 109-45.000.

Jobanputra, Amit S.: *See—*
Codd, Roger D.; Sims, Ronald I.; Olive, Robert B.; and Jobanputra, Amit S., 4,558,281, Cl. 324-433.000.

John, Erwin R., to New York University. Electroencephalographic system for intra-operative open-heart surgery. 4,557,270, Cl. 128-731.000.

Johnsen & Jorgensen Jaypak Limited: *See—*
Maloney, John, 4,557,377, Cl. 206-219.000.

Johnson, Bruce K.; and Whiteside, George D., to Polaroid Corporation. Photosensor arrangement for encoding lens and shutter blade position. 4,557,573, Cl. 354-234.100.

Johnson, Christopher P., III: *See—*
Shanklin, James R., Jr.; and Johnson, Christopher P., III, 4,558,155, Cl. 564-27.000.

Johnson, Delp W. Method of constructing foldable concrete slab buildings with access slots thru ceiling slabs for installing hingeable connectors. 4,557,099, Cl. 52-745.000.

Johnson, Douglas M., to Empak Inc. Disk package. 4,557,382, Cl. 206-444.000.

Johnson & Johnson Dental Products Company: *See—*
Martin, Brain; and Panzera, Carlino, 4,557,691, Cl. 433-199.100.

Johnson, Mark, to International Business Machines Corporation. Information storage disk transducer position control system using a prerecorded servo pattern requiring no alignment with the storage disk. 4,558,383, Cl. 360-77.000.

Johnson, Marvin M., to Phillips Petroleum Company. Catalytic hydrogenation of sulfolenes. 4,558,138, Cl. 549-87.000.

Johnson, Marvin M.; and Nowack, Gerhard P., to Phillips Petroleum Company. Chromium phosphate catalyst. 4,558,165, Cl. 568-698.000.

Johnson, Peter M., to University of Liverpool, The. Material for use in the treatment of spontaneous abortions. 4,558,035, Cl. 514-8.000.

Johnson, Robert A., to Interlake, Inc. Powered strap accumulator. 4,557,427, Cl. 242-55.000.

Johnson, Robert B.: *See—*
Barlow, George J.; Nibby, Chester M., Jr.; and Johnson, Robert B., 4,558,429, Cl. 364-900.000.

Johnson, Ronald E.: *See—*
Blanding, Wendell S.; Johnson, Ronald E.; and Van Dewoestine, Robert V., 4,557,798, Cl. 156-660.000.

Johnson Service Company: *See—*
Carusillo, Steven J., 4,558,274, Cl. 324-60.0CD.

Jolidon, Synese: *See—*
Tenud, Leander; and Jolidon, Synese, 4,558,158, Cl. 564-194.000.

Jones, Howard: *See—*
Skiles, Jerry W.; Youssefyeh, Raymond D.; Suh, John T.; and Jones, Howard, 4,558,038, Cl. 514-20.000.

Jones, Richard C.; and Powell, John M., to Gulf Research & Development Company. Method and apparatus for dynamically displaying geo-physical information. 4,558,438, Cl. 367-71.000.

Jones, Stanley P.: *See—*
Fenton, Frank A.; Booth, Brian; Jones, Stanley P.; and Gennard, Derek, 4,557,744, Cl. 65-29.000.

Jones, Thomas L. Shower mirror apparatus. 4,557,003, Cl. 4-605.000.

Jones, Willard J.; and Gannett, Thomas P., to Du Pont de Nemours, E. I., and Company. Production of dinitrodiphenyl ether. 4,558,164, Cl. 568-585.000.

Jones, William A. Down hole pump having a gas release valve. 4,557,668, Cl. 417-259.000.

Joppig, Peter; Peitz, Bernard; and Woschee, Dieter, to Daimler-Benz Aktiengesellschaft. Control arrangement for an engine exhaust brake. 4,557,233, Cl. 123-323.000.

Jorns, Norbert, to Pirzer, Carl. Method and means for flow regulation in container filling machines. 4,557,301, Cl. 141-5.000.

Josam Developments, Inc.: *See—*
Botnick, Irlin H., 4,557,288, Cl. 137-315.000.

Joseph Ayers, Inc.: *See—*
Pratt, Charles E., 4,557,842, Cl. 252-37.700.

Jourdain, Charles H.: *See—*
Bezard, Jean-Jacques; Jourdain, Charles H.; and Lalanne, Bruno, 4,558,456, Cl. 377-25.000.

Joy Manufacturing Company: *See—*
Melhuish, James J., 4,557,524, Cl. 299-64.000.

Judkins, Ren S., to Verosol USA Inc. Sun blind. 4,557,309, Cl. 160-84.00R.

Jugov, Petr I.: *See—*
Mizin, Vladimir G.; Zubarev, Alexei G.; Kolganov, Gennady S.; Volkov, Stanislav S.; Rudnev, Jury A.; Ivashina, Evgeny N.; Blinov, Konstantin A.; and Jugov, Petr I., 4,557,758, Cl. 75-51.200.

Julius Blum Gesellschaft m.b.H.: *See—*
Rock, Erich; and Hollenstein, Helmut, 4,557,531, Cl. 308-3.800.

Jung Corporation: *See—*
Drury, Alvin C., 4,556,992, Cl. 2-20.000.

Jung, Rolf, to Krauss u. Reichert GmbH & Co. KG. Manually guided power assisted cutting machine. 4,557,051, Cl. 30-273.000.

Jurden, Jerry E., to Flexion, Inc. Dock leveler seal construction. 4,557,008, Cl. 14-71.700.

Just, Melitta: *See—*
Schonafinger, Karl; Bohn, Helmut; Just, Melitta; and Martorana, Piero, 4,558,058, Cl. 514-342.000.

K. S. Konsult Kjell Sandling: *See—*
Sandling, Kjell H., 4,557,073, Cl. 49-41.000.

Kabelmetal Electro GmbH: *See—*
Wcislo, Manfred; Breitenbach, Otto; Schatz, Friedrich; and Riepling, Ulrich, 4,557,038, Cl. 29-596.000.

Kabushiki Kaisha Daikin Seisakusho: *See—*
Fukunaga, Takao, 4,557,162, Cl. 74-866.000.
Nagano, Tamio, 4,557,362, Cl. 192-106.200.
Takeuchi, Hiroshi, 4,557,702, Cl. 464-68.000.

Kabushiki Kaisha Ishida Koki Seisakusho: *See—*
Fukuda, Masao, 4,557,340, Cl. 177-1.000.
Utsunomiya, Mitito, 4,557,150, Cl. 73-862.650.

Kabushiki Kaisha Komatsu Seisakusho: *See—*
Nagahara, Yoshikazu; and Inaba, Nobuaki, 4,557,109, Cl. 60-436.000.
Tanaka, Toshihiro, 4,557,370, Cl. 198-621.000.

Kabushiki Kaisha Sankyo Seiki Seisakusho: *See—*
Isaka, Akihiko, 4,557,173, Cl. 84-95.00R.
Oguchi, Yukio; and Yasukawa, Kazuyoshi, 4,558,424, Cl. 364-513.000.

Kabushiki Kaisha Sato: *See—*
Kajiya, Hiroshi; and Sasaki, Hidetomo, 4,557,169, Cl. 83-156.000.

Kabushiki Kaisha Toshiba: *See—*
Abuyama, Yasuo, 4,557,585, Cl. 355-8.000.
Tanaka, Tatsuo, 4,558,287, Cl. 330-257.000.

Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See—*
Morishita, Toshio; Yasui, Yoshiharu; Suzuki, Yoshihisa; Seiki, Kazuo; and Nakamura, Haruyoshi, 4,557,022, Cl. 19-267.000.

Kabushiki Kaisha Universal: *See—*
Kimura, Yutaka, 4,557,483, Cl. 273-129.00S.

Kagawa, Tatsuo: *See—*
Matsuda, Waka; and Kagawa, Tatsuo, 4,557,890, Cl. 376-282.000.

Kago, Yoshiyuki; and Akita, Shigeyuki, to Nippon Soken, Inc. Visitor conversation system. 4,558,321, Cl. 340-904.000.

Kajiya, Hiroshi; and Sasaki, Hidetomo, to Kabushiki Kaisha Sato. Continuous tag cutting/feeding apparatus. 4,557,169, Cl. 83-156.000.

Kaku, Eisaburo: *See—*
Hanayama, Naoki; Kaku, Eisaburo; and Kinishi, Ryoichi, 4,558,335, Cl. 346-209.000.

Kaku, Shinkyo: *See—*
Rallapalli, Krishna; and Kaku, Shinkyo, 4,558,371, Cl. 358-261.000.

Kali-Chemie Pharma GmbH: *See—*
Kehrbach, Wolfgang; and Wegener, Joachim, 4,558,052, Cl. 514-279.000.

Kali und Salz AG: *See—*
Fricke, Gunter; Geisler, Iring; and Zentgraf, Helmut, 4,557,827, Cl. 209-127.400.

Kamata, Kazumasa; Nakai, Yoshio; and Shimomura, Yasunori, to Mitsubishi Rayon Co., Ltd. Methacrylic resin composition. 4,558,098, Cl. 525-207.000.

Kamel, Mostafa M.; Wells, Larry D.; and Buchanan, Jerry C., to Cummins Engine Company, Inc. Fuel additive injection system. 4,557,221, Cl. 123-1.00A.

Kaminaga, Hiromitsu, to Yoshida Kogyo K. K. Parapet portion of curtain wall. 4,557,088, Cl. 52-235.000.

Kaminaka, Nobuyuki; Kanai, Kenji; and Nomura, Noboru, to Matsushita Electric Industrial Co., Ltd. Thin film magnetic head. 4,558,385, Cl. 360-126.000.

Kaminski, Perry: *See—*
Buffington, Ralph M.; Kaminski, Perry; and Larson, Eugene A., 4,557,146, Cl. 73-642.000.

Kamleitner, Ewald: *See—*
Haussmann, Gerhard; and Kamleitner, Ewald, 4,557,111, Cl. 60-600.000.

Kamps, Rainer; Plewinsky, Bodo; Miehe, Manfred; and Wetz, Klaus. Agent for the separation of dissolved and/or undissolved materials of different buoyancy densities or densities by means of solutions of true metatungstates. 4,557,718, Cl. 494-37.000.

Kamyr, Inc.: *See—*
Sherman, Michael I.; Elmore, Carl L.; and Brison, Robert J., 4,557,905, Cl. 423-27.000.

Kan, Fumitaka; and Nakahata, Kimio, to Canon Kabushiki Kaisha. Magnet roll. 4,557,582, Cl. 355-3.0DD.

Kan, Masanori; Okazaki, Takuya; and Sakashita, Tatsuo, to Toyo Rubber Industry Co., Ltd., The. Composition for carcass of tire. 4,558,088, Cl. 524-505.000.

Kanai, Kenji: *See*—
Kaminaka, Nobuyuki; Kanai, Kenji; and Nomura, Noboru, 4,558,385, Cl. 360-126.000.

Kanbe, Junichiro: *See*—
Shirai, Shigeru; Kanbe, Junichiro; and Fukuda, Tadaji, 4,557,987, Cl. 430-58.000.

Kanebo Ltd.: *See*—
Koyama, Hiroaki; and Shimizu, Shigeo, 4,558,089, Cl. 524-509.000.

Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
Uekita, Masakazu; Fushiki, Yasuo; and Ooizumi, Masayuki, 4,557,784, Cl. 156-307.700.

Kaneko, Makoto, Tachi, Susumu; and Komoriya, Kiyoshi, to Agency of Industrial Science and Technology; and Ministry of International Trade and Industry. Object detecting apparatus. 4,558,215, Cl. 250-222.100.

Kaneko, Takatoshi: *See*—
Iizuka, Jiro; Kaneko, Takatoshi; and Hashiba, Tooru, 4,558,330, Cl. 346-76.0PH.

Kanematsu, Hiroyuki; Nagae, Akimitsu; and Sano, Shinji, to Yamazaki Machinery Works, Ltd. Method of judging and controlling simultaneous machining in a quadriaxial numerical control lathe. 4,558,419, Cl. 364-474.000.

Kanesaki, Nobukazu: *See*—
Etoh, Yukihiro; Tanaka, Toshiaki; Kanesaki, Nobukazu; and Miyazaki, Hiroaki, 4,557,230, Cl. 123-263.000.

Kanner, Bernard; Quirk, Jennifer M.; De Monte, Arthur P.; and Mehta, Kunj R., to Union Carbide Corporation. Process for preparing vinylaminosilanes. 4,558,146, Cl. 556-410.000.

Kanto, Masaharu; Kihara, Hisato; Teshima, Koichi; and Inaba, Michihiko, to Tokyo Shibaura Denki Kabushiki Kaisha. Color cathode ray tube with frame, mask or shield having an oxidized layer. 4,558,252, Cl. 313-402.000.

Kaplan, Jean-Pierre, to Synthelabo. Diphenylazomethines bearing an imidazolyl group and pharmaceutical compositions containing them. 4,558,062, Cl. 514-400.000.

Kara, Stephen, to SSK Enterprises, Inc. Head cleaner for floppy disk drive. 4,558,386, Cl. 360-128.000.

Karamon, Robert J.; and Allen, Robert T., to Herff Jones, Inc. Yellow gold alloy. 4,557,895, Cl. 420-587.000.

Karlsson, Lars, to Diab-Barracuda AB. Camouflage controlling reflection of both long and short radar waves. 4,557,965, Cl. 428-196.000.

Karp, Arthur, to Varian Associates, Inc. Velocity tapering of comb-quad traveling-wave tubes. 4,558,256, Cl. 315-3.500.

Kasagi, Hiroshi: *See*—
Hara, Masanori; Sugawara, Sakuo; Yamazaki, Kisuke; and Kasagi, Hiroshi, 4,557,247, Cl. 126-99.00R.

Kashima, Osamu; and Shibata, Masamichi, to Nippondenso Co., Ltd. Ignition apparatus for internal combustion engines. 4,557,229, Cl. 123-169.0EL.

Kasnick, Richard A. Hose nozzle for fire fighting kit. 4,557,289, Cl. 137-355.280.

Katayama, Toshiaki: *See*—
Haneishi, Tatsuo; Okazaki, Takao; Torikata, Akio; Nakajima, Mutsuo; Enokita, Ryuzou; Katayama, Toshiaki; and Iwado, Seigo, 4,557,933, Cl. 424-118.000.

Kato, Hideo, to Tenyo Co., Ltd. Cigarette case jugglery device. 4,557,476, Cl. 272-8.00N.

Kato, Kazuo: *See*—
Aoyama, Toshimi; Tohda, Hiroyuki; Kato, Kazuo; and Nakane, Hisashi, 4,557,996, Cl. 430-324.000.
Yamada, Kazuji; Sato, Hideo; Kitadate, Yukitaka; Kawakami, Kanji; Kato, Kazuo; and Sasayama, Takao, 4,558,238, Cl. 307-491.000.

Kato, Shigeru: *See*—
Takanashi, Itsuo; Tanaka, Hideshi; Tsumiyama, Hisanori; Mizuno, Yoshio; Ohara, Terumi; Kato, Shigeru; Takahasi, Toshinori; and Kiuchi, Tsutomu, 4,558,328, Cl. 346-76.0PH.

Kato, Takashi; Yoshikawa, Tomio; Sato, Keiji; and Yoshioka, Kazuo, to Hitachi, Ltd. Control circuit for air conditioner. 4,557,114, Cl. 62-126.000.

Katsumata, Kenichiro; and Nobuta, Yasuo, to Tokyo Shibaura Denki Kabushiki Kaisha. Positioning unit for radiation tomography apparatus. 4,558,458, Cl. 378-20.000.

Katsuyama, Mikizo: *See*—
Fujii, Teruo; and Katsuyama, Mikizo, 4,558,214, Cl. 250-216.000.

Katushiki Kiisha Kuken: *See*—
Shibata, Ryoichi, 4,557,337, Cl. 173-93.500.

Katz, Ronald A.; and Goldman, Robert N., to Light Signatures, Inc. Merchandise verification and information system. 4,558,318, Cl. 340-825.340.

Kavinsky, Clifford: *See*—
Goldwasser, Eugene; Kavinsky, Clifford; and Weiss, Tania L., 4,558,005, Cl. 435-7.000.

Kawabata, Yoshimasa; and Otsuki, Susumu, to Matsushita Electric Industrial Co., Ltd. Display device for portable type electrical equipment. 4,558,396, Cl. 361-399.000.

Kawabe, Toshihiko: *See*—
Amemori, Koichi; Takahashi, Yosuke; Miyazaki, Manabu; Tsukahara, Hiroaki; Kawabe, Toshihiko; and Banba, Toshio, 4,557,235, Cl. 123-367.000.

Kawachi, Masayuki; and Kono, Yasushi, to Mazda Motor Corporation. Fuel injection means having air bleed means. 4,557,241, Cl. 123-585.000.

Kawada, Mitsuru: *See*—
Sugihara, Hirosada; Watanabe, Masazumi; Kawada, Mitsuru; and Imada, Isuke, 4,558,068, Cl. 514-462.000.

Kawai, Kiyoji; and Omori, Tadashi, to Mitsubishi Denki Kabushiki Kaisha. Elevator call entry system. 4,558,298, Cl. 340-19.00R.

Kawakami, James H.; and Maresca, Louis M , to Union Carbide Corporation. Polymerization process using metal formate to reduce the color of thermoplastic copolymers. 4,558,106, Cl. 526-216.000.

Kawakami, Kanji: *See*—
Yamada, Kazuji; Sato, Hideo; Kitadate, Yukitaka; Kawakami, Kanji; Kato, Kazuo; and Sasayama, Takao, 4,558,238, Cl. 307-491.000.

Kawakami, Takao: *See*—
Orii, Ken; and Kawakami, Takao, 4,557,184, Cl. 98-115.300.

Kawamura, Kouichi: *See*—
Horie, Seiji; Kawamura, Kouichi; Makino, Naonori; and Sato, Hideo, 4,557,988, Cl. 430-58.000.

Kawamura, Takahide: *See*—
Akiyama, Susumu; Ito, Kenzo; Fukaya, Hiroyasu; Ogiso, Haruhiko; Hirabayashi, Yuji; and Kawamura, Takahide, 4,558,417, Cl. 364-431.110.

Kawasaki, Hiroshi: *See*—
Yokoyama, Shigeki; Okamura, Hisashi; Maekawa, Yukio; and Kawasaki, Hiroshi, 4,558,001, Cl. 430-527.000.

Kawasaki, Kazuhiro; and Muranaka, Akio, to Honda Giken Kogyo Kabushiki Kaisha. Fullface-type helmet. 4,556,994, Cl. 2-424.000.

Kawasaki, Takao; Immaru, Daisaku; Tsuchiya, Tadashi; Yamaguchi, Yukiharu; and Komatsu, Katsumi, to Kureha Kagaku Kogyo Kabushiki Kaisha. 2-Substituted-phenylthiazole derivatives. 4,558,059, Cl. 514-371.000.

Kawasaki Yucoh Co., Ltd.: *See*—
Masuda, Shigeru; and Yashima, Tsuneaki, 4,557,889, Cl. 264-320.000.

Kawashima, Yukio, to Mizuno Corporation. Insole with exchangeable reliant pieces. 4,557,060, Cl. 36-44.000.

Kazda, Stanislav: *See*—
Seidel, Wolfgang; Kazda, Stanislav; and Knorr, Andreas, 4,558,055, Cl. 514-291.000.

KB WIBRA: *See*—
Forsgren, Roland; Garpendahl, Gunnar; Eriksson, Hans; and Wallentin, Bengt, 4,558,311, Cl. 340-680.000.

Keane, James W., to Whirlpool Corporation. Electrical hose swivel connector for canister vacuum cleaner. 4,557,535, Cl. 339-5.00R.

Keearns, Larry R., to E-Systems, Inc. Leading edge estimator for navigation system. 4,558,418, Cl. 364-450.000.

Kehrbach, Wolfgang; and Wegener, Joachim, to Kali-Chemie Pharma GmbH. 10-Bromosandwicine, 10-bromoisosandwicine, pharmaceutical compositions thereof, and methods of treating heart rhythm disorders with them. 4,558,052, Cl. 514-279.000.

Keller, Robert R., Sr. Curvilinear structural insulating panel and method of making the same. 4,557,090, Cl. 52-245.000.

Kelly, Thomas L. Roofing structure with hermetically sealed panels. 4,557,081, Cl. 52-94.000.

Kemp, Anne H.: *See*—
Quamme, Jane E.; and Kemp, Anne H., 4,558,080, Cl. 524-72.000.

Kempsmith Machine Company: *See*—
Robinson, Daniel T., 4,557,715, Cl. 493-244.000.

Kennedy, James C.; Trimnell, Lawrence J.; and Zola, Meyer J., to AT&T Laboratories. Switching system having selectively interconnected remote switching modules. 4,558,444, Cl. 370-58.000.

Kennedy Tank & Manufacturing Company, Inc.: *See*—
Nipple, Stephen B., 4,557,322, Cl. 165-158.000.

Kenney, Malachi P.; Young, Kenneth P.; and Koch, Alan A., to International Telephone and Telegraph Corporation. Apparatus for the continuous production of metal alloy composites. 4,557,605, Cl. 366-134.000.

Kenyon, John W.: *See*—
Banas, Robert M.; and Kenyon, John W., 4,557,487, Cl. 277-12.000.

Keptel, Inc.: *See*—
Perry, Steven B.; and Miller, Joseph, 4,558,182, Cl. 179-81.00R.

Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung: *See*—
Furst, Leander; and Holzer, Walter, 4,557,811, Cl. 204-105.00R.

Kerr-McGee Chemical Corporation: *See*—
Davis, Robert E.; and Robertson, Wilbert J., 4,557,913, Cl. 423-279.000.

Keuper, James C.: *See*—
Jahnke, Richard P.; Keuper, James C.; and Hunnicutt, Wayne E., 4,557,625, Cl. 404-25.000.

Keuro Maschinenbau Gesellschaft mit beschrankter Haftung & Co. Kommanditgesellschaft: *See*—
Stolzer, Paul, 4,557,171, Cl. 83-796.000.

Khmeljuk, Alexei M.: *See*—
Kontar, Evgeny A.; Soloviev, Sergei L.; Brovko, Viktor P.; Glukhikh, Rudolf G.; Khomyakov, Evgeny N.; Pakhomov, Jury F.; Khmeljuk, Alexei M.; Vyalykh, Vladimir I.; Zansokhov, Leonid G.; Smertin, Valentin P.; Evseev, Alexei I.; and Sharipov, Fyarit A., 4,557,697, Cl. 441-2.000.

Khomyakov, Evgeny N.: *See*—
Kontar, Evgeny A.; Soloviev, Sergei L.; Brovko, Viktor P.; Glukhikh, Rudolf G.; Khomyakov, Evgeny N.; Pakhomov, Jury F.; Khmeljuk, Alexei M.; Vyalykh, Vladimir I.; Zansokhov, Leonid G.; Smertin, Valentin P.; Evseev, Alexei I.; and Sharipov, Fyarit A., 4,557,697, Cl. 441-2.000.

Khuong, Nhon H. Space-saving hanging device. 4,557,452, Cl. 248-214.000.

Kickle, Hunter L.: *See*—
McDaniel, Robert S., Jr.; Glor, Paul R.; and Kickle, Hunter L., 4,557,729, Cl. 8-111.000.
Kida, Masahiko: *See*—
Matsumura, Hisashi; Hashimoto, Toyokazu; Kida, Masahiko; and Wada, Hiroyuki, 4,558,428, Cl. 364-900.000.
Kida, Susumu; Usami, Hayato; and Aoki, Hideji, to Fujitsu Limited. Highly reliable hermetically sealed package for a semiconductor device. 4,558,346, Cl. 357-74.000.
Kidder, Kenneth B.: *See*—
Black, Robert A., Jr.; Clark, Rodney L.; Kidder, Kenneth B.; and Patton, Paul B., 4,558,389, Cl. 361-88.000.
Kiess, Helmut G.; Binggeli, Bruno K.; and Derendinger, Max, to RCA Corporation. Method of producing capacitive electronic discs. 4,557,885, Cl. 264-105.000.
Kiess, Helmut G.; Binggeli, Bruno K.; and Derendinger, Max, to RCA Corporation. Method of producing capacitive electronic discs. 4,557,886, Cl. 264-105.000.
Kightlinger, Adrian P.; and Hubbard, E. Daniel, to Grain Processing Corporation. Absorbent compositions. 4,558,100, Cl. 525-329.100.
Kihara, Hisato: *See*—
Kanto, Masaharu; Kihara, Hisato; Teshima, Koichi; and Inaba, Michihiko, 4,558,252, Cl. 313-402.000.
Kihara, Kunio; Toda, Hideo; Mori, Motokuni; and Morooka, Koji, to Mitsubishi Petrochemical Co., Ltd.; and Mitsubishi Yuka Pharmaceutical Co., Ltd. Anticholesteremic anion exchange resins. 4,557,930, Cl. 424-79.000.
Kikuchi, Keisuke; Morikawa, Takitaro; Shimada, Junichi; and Sakurai, Kenjiro, to Agency of Industrial Science & Technology; and Ministry of International Trade & Industry. Spherical lens for spherically symmetrical graded refractive index distribution provided with rod clad. 4,557,566, Cl. 350-413.000.
Kilthau, Heinz: *See*—
Roos, Hans; Schlaefer, Dieter; Boehn, Hugo; Bittler, Knut; and Kilthau, Heinz, 4,557,818, Cl. 204-288.000.
Kim, Bonjue: *See*—
Kim, Sun; and Kim, Bonjue, 4,557,056, Cl. 33-366.000.
Kim, Ki-Soo: *See*—
DiSalvo, Anthony L.; and Kim, Ki-Soo, 4,557,860, Cl. 252-512.000.
Kim, Suk K.; and Meleis, Hanafy E. S., to AT&T Bell Laboratories. High impedance amplifier for an IC chip. 4,558,239, Cl. 307-494.000.
Kim, Sun; and Kim, Bonjue. Electronic angle indicator. 4,557,056, Cl. 33-366.000.
Kim, Tai K.; and McClintic, Robert P., to GTE Products Corporation. Method of producing crystalline ammonium metatungstate. 4,557,924, Cl. 423-593.000.
Kimoto, Toshifumu: *See*—
Saitoh, Koichi; Horie, Kiyoshi; Itami, Teruhiko; and Kimoto, Toshifumu, 4,558,327, Cl. 346-74.200.
Kimura, Tsutomu: *See*—
Tsuchiya, Takeshi; Samejima, Shuji; and Kimura, Tsutomu, 4,557,492, Cl. 277-216.000.
Kimura, Yoshiaki; and Tanaka, Yasuhiko, to Konishiroku Photo Industry Co., Ltd. Purging system for ink jet recording apparatus. 4,558,326, Cl. 346-1.100.
Kimura, Yutaka, to Kabushiki Kaisha Universal. Ball shooting apparatus for pinball game machine. 4,557,483, Cl. 273-129.00S.
Kinard, Michael D.: *See*—
Bohannon, William D., Jr.; Collins, Roy P.; Kinard, Michael D.; and Weinraub, William C. L., 4,557,560, Cl. 350-96.230.
Kindermann, Peter. Sail rig for bicycle. 4,557,495, Cl. 280-213.000.
Kindig, Alan L., to General Electric Company. Automatic system for compressing coil turns and inserting insulators in slots of a slotted stator core. 4,557,042, Cl. 29-734.000.
King, Francis D., to Beecham Group p.l.c. 1,2,4-Benzothiadiazines. 4,558,044, Cl. 514-222.000.
King, James: *See*—
Tubbs, Paul; and King, James, 4,557,839, Cl. 252-23.000.
Kinishi, Ryoichi: *See*—
Hanayama, Naoki; Kaku, Eisaburo; and Kinishi, Ryoichi, 4,558,335, Cl. 346-209.000.
Kinley, Karl S.; and Pratt, Allyn R., to J. C. Kinley Company. Roller arm centralizer. 4,557,327, Cl. 166-241.000.
Kinoshita, Hiroshi: *See*—
Ozawa, Toru; and Kinoshita, Hiroshi, 4,557,058, Cl. 34-82.000.
Kinsley, Homan B., Jr., to James River Corporation. Process of forming a porous cellulosic paper from a thermal treated cellulosic non-bonding pulp. 4,557,800, Cl. 162-20.000.
Kinsolving, Clyde R.: *See*—
Georgiev, Vassil S.; and Kinsolving, Clyde R., 4,557,865, Cl. 260-239.30T.
Kinter, Mark D.: *See*—
Fortman, Lloyd D.; and Kinter, Mark D., 4,557,739, Cl. 55-320.000.
Kioritz Corporation: *See*—
Baba, Toru; and Saito, Yasuo, 4,557,052, Cl. 30-276.000.
Kirch, William: *See*—
Carrick, Wayne L.; Solvik, R. Sven; and Kirch, William, 4,558,105, Cl. 526-68.000.
Kirin-Amgen, Inc.: *See*—
Egrie, Joan C., 4,558,006, Cl. 435-7.000.
Kirsch, Warren B.; and Laurent, Sebastian M., to Ethyl Corporation. Purification of halide. 4,557,921, Cl. 423-488.000.
Kishi, Norimasa: *See*—
Noso, Kazunori; Kishi, Norimasa; and Futami, Toru, 4,558,459, Cl. 381-43.000.
Kishida, Kazuo; Yamamoto, Naoki; and Sato, Yasumasa, to Mitsubishi Rayon Co., Ltd. Thermoplastic resin having excellent impact resistance and heat resistance. 4,558,099, Cl. 525-301.000.
Kitadate, Yukitaka: *See*—
Yamada, Kazuji; Sato, Hideo; Kitadate, Yukitaka; Kawakami, Kanji; Kato, Kazuo; and Sasayama, Takao, 4,558,238, Cl. 307-491.000.
Kitahara, Takahiro: *See*—
Ohmori, Akira; Tomihashi, Nobuyuki; and Kitahara, Takahiro, 4,557,562, Cl. 350-96.340.
Kitamori, Takehiko; Fujii, Masaaki; and Sawada, Tsuguo, to Hitachi, Ltd. Photoacoustic analyzer. 4,557,137, Cl. 73-24.000.
Kitazume, Tomoya: *See*—
Ishikawa, Nobuo; and Kitazume, Tomoya, 4,558,148, Cl. 556-488.000.
Kitta, Toshiyuki; and Abe, Wataru, to Japanese National Railways; and Oiles Industry Co., Ltd. Metallic sheath for a posttensioning method provided with rust proofing treatment. 4,557,087, Cl. 52-230.000.
Kittler, Reinhold, to Dectron Inc. Swimming pool dehumidifier. 4,557,116, Cl. 62-238.600.
Kitz Corporation: *See*—
Nagano, Tsutomu, 4,557,286, Cl. 137-74.000.
Kiuchi, Tsutomu: *See*—
Takanashi, Itsuo; Tanaka, Hideshi; Tsumiyama, Hisanori; Mizuno, Yoshio; Ohara, Terumi; Kato, Shigeru; Takahasi, Toshinori; and Kiuchi, Tsutomu, 4,558,328, Cl. 346-76.0PH.
Klauke, Erich: *See*—
Baasner, Bernd; and Klauke, Erich, 4,558,166, Cl. 570-144.000.
Klebold, Franklin R. Combination collapsible funnel and canister therefor. 4,557,378, Cl. 206-223.000.
Kleeb, Thomas R.: *See*—
Petrak, Daniel R.; Winkelbauer, Howard M.; Kleeb, Thomas R.; and Wang, Ke-Chin, 4,557,884, Cl. 264-65.000.
Kleemann, Wolfgang: *See*—
Klose, Sigmar; Pasch, Manfred; Kleemann, Wolfgang; Vieth, Friedhelm; and Buschek, Herbert, 4,557,600, Cl. 356-246.000.
Klimes, Stanislav: *See*—
Henzl, Jindrich; Kuda, Vladimir; Vasicek, Vladimir; and Klimes, Stanislav, 4,557,299, Cl. 139-452.000.
Klobas, John: *See*—
Dulski, John; and Klobas, John, 4,557,314, Cl. 164-287.000.
Klockner-Becorit GmbH: *See*—
Watermann, Willy; and Hachenberg, Winfried, 4,557,635, Cl. 405-296.000.
Klockner-Humboldt-Deutz AG Zweigniederlassung Fahr: *See*—
Schaible, Siegfried, 4,557,189, Cl. 100-4.000.
Klose, Sigmar; Pasch, Manfred; Kleemann, Wolfgang; Vieth, Friedhelm; and Buschek, Herbert, to Boehringer Mannheim GmbH. Process and device for the control and mixing of a fluid current subjected to centrifugal force. 4,557,600, Cl. 356-246.000.
Klovensky, Edward J.: *See*—
Bolinsky, Henry E.; and Klovensky, Edward J., 4,557,699, Cl. 445-3.000.
Kluge, Arthur F.; Clark, Robin D.; and Strosberg, Arthur M., to Syntex (U.S.A.) Inc. Benzodioxanyl-hydroxyethylene-piperazinyl acetanilides which effect calcium entry and β-blockade. 4,558,129, Cl. 544-377.000.
Kluth, Hermann; and Wegner, Jurgen, to Henkel Kommanditgesellschaft auf Aktien. Composition for the production of polyurethane foam materials having improved form stability. 4,558,073, Cl. 521-110.000.
Knapp, Richard W.: *See*—
Gibbons, John F.; and Knapp, Richard W., 4,557,891, Cl. 376-397.000.
Knappe, Bernhard, to FAG Kugelfischer Georg Schafer Kommanditgesellschaft Auf.Akt. Anti-friction bearing with a segmented cage, particularly for large cylindrical roller bearings. 4,557,614, Cl. 384-573.000.
Knebel, Michael; and Schulein, Rolf G., to Leifheit AG. Wiper appliance. 4,557,012, Cl. 15-116.00R.
Knifton, John F.: *See*—
Grigsby, Robert A., Jr.; and Knifton, John F., 4,558,072, Cl. 518-701.000.
Knorr, Andreas: *See*—
Seidel, Wolfgang; Kazda, Stanislav; and Knorr, Andreas, 4,558,055, Cl. 514-291.000.
Koberg, Gerd: *See*—
Six, Jorg; and Koberg, Gerd, 4,557,023, Cl. 24-16.0PB.
Kobayashi, Fumiyuki: *See*—
Yamada, Minoru; Masaki, Akira; Yamamoto, Masakazu; Nakanishi, Keiichirou; Nishida, Takashi; Daikoku, Takahiro; Kobayashi, Fumiyuki; and Imai, Kuninori, 4,558,395, Cl. 361-385.000.
Kobayashi, Kazuhiro: *See*—
Hayashi, Kiyoshi; Hori, Setsuo; Hirata, Nobuyuki; Kobayashi, Kazuhiro; and Mizuno, Masayuki, 4,557,586, Cl. 355-11.000.
Kobayashi, Masatsune; Eida, Tsuyoshi; Koike, Shoji; Yokoyama, Yasumasa; and Komori, Tomoko, to Canon Kabushiki Kaisha. Recording liquid. 4,557,761, Cl. 106-22.000.
Kobayashi, Takeo: *See*—
Tano, Eiichi; Kobayashi, Takeo; and Negishi, Kiyoshi, 4,557,575, Cl. 354-289.100.
Kobler, Ingo, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. Printing plate attachment arrangement. 4,557,196, Cl. 101-415.100.
Koch, Alan A.: *See*—
Kenney, Malachi P.; Young, Kenneth P.; and Koch, Alan A., 4,557,605, Cl. 366-134.000.

Koch, Eckhard; Vogg, Gunter; and Soller, Jochen, to Vereinigte Flugtechnische Werke GmbH. Latching cargo in aircraft. 4,557,648, Cl. 410-78.000.
Koch, Richard C. Media storage device. 4,557,533, Cl. 312-12.000.
Koehl, Stephen E.; and Tiller, Charles R., to Cooper Industries, Inc. Ignition secondary analyzer. 4,558,280, Cl. 324-399.000.
Koerner, Gotz: *See*—
Callaghan, Ian C.; Fink, Hans-Ferdi; Gould, Clive M.; Koerner, Gotz; Patzke, Hans-Jurgen; and Weitemeyer, Christian, 4,557,737, Cl. 55-87.000.
Koga, Kazuyuki: *See*—
Suzuki, Fumio; Ohnuma, Toshio; Koga, Kazuyuki; and Watanabe, Tatsuya, 4,557,046, Cl. 29-749.000.
Kohen, Eliezer H.: *See*—
Atanassov, Lyuben P.; Kohen, Eliezer H.; Maleshkov, Vladimir D.; Antonov, Dimo P.; Russev, Lyubomir S.; and Georgiev, Georgi A., 4,558,408, Cl. 364-130.000.
Kohli, Dalip K.: *See*—
Draney, Daniel R.; and Kohli, Dalip K., 4,558,078, Cl. 523-468.000.
Kohno, Atsuo; and Shiiba, Minoru, to Fuji Photo Film Co., Ltd. Camera with protective cover. 4,557,574, Cl. 354-288.000.
Kohno, Hideki: *See*—
Yamamoto, Etsuji; Sekihara, Kensuke; Kohno, Hideki; and Yamamoto, Shinji, 4,558,425, Cl. 364-555.000.
Koike, Shoji: *See*—
Kobayashi, Masatsune; Eida, Tsuyoshi; Koike, Shoji; Yokoyama, Yasumasa; and Komori, Tomoko, 4,557,761, Cl. 106-22.000.
Kokado, Hiroshi: *See*—
Miyakawa, Nobuhiro; Kokado, Hiroshi; and Inoue, Eiichi, 4,557,856, Cl. 252-500.000.
Kolb, Alfred. Optical projection profile-grinding machine. 4,557,077, Cl. 51-165.720.
Kolganov, Gennady S.: *See*—
Mizin, Vladimir G.; Zubarev, Alexei G.; Kolganov, Gennady S.; Volkov, Stanislav S.; Rudnev, Jury A.; Ivashina, Evgeny N.; Blinov, Konstantin A.; and Jugov, Petr I., 4,557,758, Cl. 75-51.200.
Kolt, Stanley, to Suroff, Leonard W., a part interest. Incrementally adjustable vent. 4,557,183, Cl. 98-42.160.
Komatsu, Katsumi: *See*—
Kawasaki, Takao; Immaru, Daisaku; Tsuchiya, Tadashi; Yamaguchi, Yukiharu; and Komatsu, Katsumi, 4,558,059, Cl. 514-371.000.
Komatsu, Toshiyuki: *See*—
Nakagawa, Katsumi; Komatsu, Toshiyuki; Hirai, Yutaka; Misumi, Teruo; and Fukuda, Tadaji, 4,557,990, Cl. 430-84.000.
Nakagawa, Katsumi; Mochizuki, Noritaka; Komatsu, Toshiyuki; Fukaya, Masaki; and Kuno, Mitsutoshi, 4,558,357, Cl. 358-75.000.
Komiya, Yutaka; Murakami, Katsumi; Inuzuka, Tsuneki; and Sakamaki, Hisashi, to Canon Kabushiki Kaisha. Related to control while apparatus is in an improper operational state. 4,557,587, Cl. 355-14.00C.
Komiyama, Choji; Oishi, Kengo; Suzuki, Osamu; and Iyota, Yasumasa, to Fuji Photo Film Co., Ltd. Magnetic tape cassette and storage case. 4,557,380, Cl. 206-387.000.
Komoda, Sei-ichi, to Hitachi, Ltd. Nuclear fuel element. 4,557,892, Cl. 376-412.000.
Komori, Tomoko: *See*—
Kobayashi, Masatsune; Eida, Tsuyoshi; Koike, Shoji; Yokoyama, Yasumasa; and Komori, Tomoko, 4,557,761, Cl. 106-22.000.
Komoriya, Kiyoshi: *See*—
Kaneko, Makoto; Tachi, Susumu; and Komoriya, Kiyoshi, 4,558,215, Cl. 250-222.100.
Komossa, Werner: *See*—
Elsner, Uwe; and Komossa, Werner, 4,557,074, Cl. 51-5.00D.
Kondo, Hiroshi; Nadamoto, Hiroyasu; and Takamatsu, Yoshikazu, to Nihon Radiator Co., Ltd. Serpentine type evaporator. 4,557,324, Cl. 165-174.000.
Konishi Chemical Industry Co., Ltd.: *See*—
Morita, Yukichi; Ono, Koji; Ogata, Eiji; and Manabe, Osamu, 4,558,161, Cl. 568-34.000.
Konishiroku Photo Industry Co., Ltd.: *See*—
Haneda, Satoshi; and Hiratsuka, Seiichiro, 4,557,992, Cl. 430-122.000.
Kimura, Yoshiaki; and Tanaka, Yasuhiko, 4,558,326, Cl. 346-1.100.
Koyama, Mikio; Okaniwa, Kenichiro; Saruhashi, Masakuni; and Ohmachi, Yuko, 4,557,901, Cl. 422-56.000.
Serizawa, Moriyoshi; and Hakamada, Haruo, 4,557,591, Cl. 355-40.000.
Takagiwa, Hiroyuki; Takahashi, Jiro; Shirose, Meizo; Inaba, Naomi; and Seki, Megumi, 4,557,991, Cl. 430-109.000.
Kono, Yasushi: *See*—
Kawachi, Masayuki; and Kono, Yasushi, 4,557,241, Cl. 123-585.000.
Konovalova, Nina P.: *See*—
Emanuel, Nikolai M.; Rozenberg, Albina N.; Golubev, Valery A.; Bogdanov, Gennady N.; Vasilieva, Ljubov S.; and Konovalova, Nina P., 4,558,127, Cl. 544-310.000.
Kontar, Evgeny A.; Soloviev, Sergei L.; Brovko, Viktor P.; Glukhikh, Rudolf G.; Khomyakov, Evgeny N.; Pakhomov, Jury F.; Khmeljuk, Alexei M.; Vyalykh, Vladimir I.; Zansokhov, Leonid G.; Smertin, Valentin P.; Evseev, Alexei I.; and Sharipov, Fyarit A., to Institut Okeanologii Imeni P.P. Shirshova. Method of delivering to ocean bottom and raising to surface of station for deep water researches and design of station delivered using said method. 4,557,697, Cl. 441-2.000.
Kopatz, Heinz-Dieter, to William Prym-Werke KG. Friction gear transmission. 4,557,155, Cl. 74-200.000.
Korthaus, Helmut: *See*—
Wilke, Richard; and Korthaus, Helmut, 4,557,355, Cl. 188-173.000.
Kosky, Philip G.: *See*—
McKee, Douglas W.; Spiro, Clifford L.; and Kosky, Philip G., 4,558,027, Cl. 502-181.000.
Kotani, Sumihisa: *See*—
Murayama, Akira; Kuno, Hiroaki; Uchikawa, Naoshi; Tamura, Takahiro; Mizuno, Takao; Kotani, Sumihisa; Tomita, Yoshikatsu; Arata, Tetsuya; Shiibayashi, Masao; and Suefuji, Kazutaka, 4,557,675, Cl. 418-55.000.
Kotliar, Abraham M.; Sibilia, John P.; Hughes, Ronald H.; and Landy, Richard A., to Allied Corporation. Periclase refractory brick with oxyhydrocarbon component. 4,558,019, Cl. 501-101.000.
Kovacs, Jenoe: *See*—
Heil, Guenter; Lenz, Werner; and Kovacs, Jenoe, 4,557,813, Cl. 204-159.140.
Koyama, Etsuo; and Nakamura, Kazuhiro, to Tekudaiya Kabushiki Kaisha. Moving coil type pickup cartridge. 4,558,443, Cl. 369-139.000.
Koyama, Hiroaki; and Shimizu, Shigeo, to Kanebo Ltd. Resin composition containing granular or powdery phenol-aldehyde resin. 4,558,089, Cl. 524-509.000.
Koyama, Mikio; Okaniwa, Kenichiro; Saruhashi, Masakuni; and Ohmachi, Yuko, to Konishiroku Photo Industry Co., Ltd. Analytical element. 4,557,901, Cl. 422-56.000.
Kozlowski, Edward R.: *See*—
Williams, James E.; and Kozlowski, Edward R., 4,557,389, Cl. 211-13.000.
Kraft, Wayne R.: *See*—
Freeman, Joseph W.; Kraft, Wayne R.; Kurtz, Hobart L.; and Magrisso, Israel B., 4,558,447, Cl. 371-71.000.
Kramert, Arthur R. Firebox for burning solid fuels cleanly. 4,557,250, Cl. 126-125.000.
Krampe, Josef. Wire and cable stripping device. 4,557,164, Cl. 81-9.410.
Kranz, Ken E.: *See*—
Stewart, Norman L., Jr.; and Kranz, Ken E., 4,557,748, Cl. 71-32.000.
Kratzer, Reinhold H.: *See*—
Paciorek, Kazimiera J. L.; Kratzer, Reinhold H.; Harris, David H.; Smythe, Mark E.; and Nakahara, James H., 4,557,869, Cl. 260-349.000.
Kraus, Georg: *See*—
Druschke, Frank; Kraus, Georg; Kuenzel, Ulrich; Ruh, Wolf D.; and Schaefer, Rolf, 4,557,796, Cl. 156-643.000.
Krause, Hans-Joachim: *See*—
Bronstert, Klaus; Nickl, Johann; Krause, Hans-Joachim; and Schmitt, Werner, 4,558,104, Cl. 526-65.000.
Krauss u. Reichert GmbH & Co. KG: *See*—
Jung, Rolf, 4,557,051, Cl. 30-273.000.
Krekacs, Sandor: *See*—
Palfi, Zoltan; and Krekacs, Sandor, 4,557,875, Cl. 261-75.000.
Krenmayr, Franz; Lichtenegger, Franz; and Goschl, Peter, to Voest-Alpine Aktiengesellschaft. Apparatus for dewatering water-containing materials. 4,557,833, Cl. 210-386.000.
Krenzer, Eberhard, to Barmag Barmer Maschinenfabrik Ag. Texturing machine. 4,557,689, Cl. 432-59.000.
Krezak, John E.; and Lamb, Michael F., to Boeing Company, The. Emergency flight deck egress lines. 4,557,442, Cl. 244-137.00P.
Krieger, Karl: *See*—
Guens, Guy; and Krieger, Karl, 4,557,293, Cl. 137-625.650.
Krishnan, Sivaram; and Sanderson, John R., to Mobay Chemical Corporation. 4,4'-Bis(4-hydroxyphenyl thio)biphenyls. 4,558,162, Cl. 568-48.000.
Kroy, Inc.: *See*—
Richardson, Michael M.; and Schaffer, Douglas A., 4,557,617, Cl. 400-208.000.
Krug, Aribert: *See*—
Deimling, Karl; Falk, Roland; Krug, Aribert; Nagel, Peter; and Sand, Rudolf, 4,557,947, Cl. 427-130.000.
Kuda, Vladimir: *See*—
Henzl, Jindrich; Kuda, Vladimir; Vasicek, Vladimir; and Klimes, Stanislav, 4,557,299, Cl. 139-452.000.
Kudo, Shiro; and Akaba, Kunihisa, to Asahi-matsu Foods Inc.; and Takeda Chemical Industries, Ltd. Soybean-based fibrous food material having improved preservability and texture. 4,557,936, Cl. 426-104.000.
Kuehlein, Georg; and Gerlach, Ernst, to Rehau Plastiks AG & Co. Multilayer medical working means. 4,557,959, Cl. 428-36.000.
Kuehnl, Charles M., to Miller-Woods Inc. Apparatus for supplying fuel to an engine. 4,557,238, Cl. 123-492.000.
Kuenzel, Ulrich: *See*—
Druschke, Frank; Kraus, Georg; Kuenzel, Ulrich; Ruh, Wolf D.; and Schaefer, Rolf, 4,557,796, Cl. 156-643.000.
Kugele, Thomas G., to Morton Thiokol, Inc. Stabilizer compositions and polymers containing same. 4,558,083, Cl. 524-181.000.
Kuhls, Jurgen: *See*—
Walch, Axel; Seifried, Walter; Michel, Wolfgang; Kuhls, Jurgen; and Wildhardt, Jurgen, 4,557,955, Cl. 428-35.000.
Kuhn S.A.: *See*—
Toillie, Alain; and Wolff, Michel, 4,557,104, Cl. 56-13.600.
Kuhne, Roland: *See*—
Epenoy, Gabriel; and Kuhne, Roland, 4,558,455, Cl. 375-112.000.
Kuhns, Roger J. Method for thwarting forgery of fingerprint-bearing identification media. 4,557,504, Cl. 283-68.000.

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Mikusch, Gerald; and Munch, Werner, 4,557,133, Cl. 72-405.000.

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Walworth, Robert S.; Hinshaw, Jay; and LaBotz, Arnold H., 4,557,080, Cl. 52-9.000.

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Schutten, Herman P.; Benjamin, James A.; and Lade, Robert W., 4,558,243, Cl. 307-584.000.

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Bolduc, Richard M.; and Lagarde, Paul R., 4,557,517, Cl. 296-1.00S.

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Broers, Alec N.; and Laibowitz, Robert B., 4,557,995, Cl. 430-296.000.

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Bezard, Jean-Jacques; Jourdain, Charles H.; and Lalanne, Bruno, 4,558,456, Cl. 377-25.000.

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Woolley, Warren H.; Lama, William L.; Rees, James D.; and Durbin, John A., 4,557,581, Cl. 355-1.000.

Lamb, Michael F.: *See*—
Krezak, John E.; and Lamb, Michael F., 4,557,442, Cl. 244-137.00P.

Lampson, Butler W.: *See*—
Schmidt, Eric E.; and Lampson, Butler W., 4,558,413, Cl. 364-300.000.

Landis, Phillip S.: *See*—
Horodysky, Andrew G.; and Landis, Phillip S., 4,557,845, Cl. 252-49.900.

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Douglas, Alan D.; Reilly, Kenneth T.; and Landmesser, John E., 4,557,906, Cl. 423-49.000.

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Landy, Richard A.: *See*—
Kotliar, Abraham M.; Sibilia, John P.; Hughes, Ronald H.; and Landy, Richard A., 4,558,019, Cl. 501-101.000.

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Larjola, Jaakko. Energy converter. 4,558,228, Cl. 290-52.000.

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Larson, Larry L.: *See*—
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Larson, Wayne K., to Minnesota Mining and Manufacturing Company. Sulfonate-containing photopolymer systems. 4,558,149, Cl. 560-14.000.

Larsson, Kare: *See*—
af Ekenstam, Bo T.; Glantz, Per-Olof; and Larsson, Kare, 4,557,935, Cl. 424-130.000.

Lash, Edward G.; Levy, Roger; and Nickels, Charles J., to Tishken Products Co. Multiple tooling roll forming machine with turret type rotary motion. 4,557,129, Cl. 72-176.000.

Laska, Eugene M.: *See*—
Sunshine, Abraham; Laska, Eugene M.; and Siegel, Carole E., 4,558,051, Cl. 514-261.000.

Laskowski, Zbigniew: *See*—
Brzosko, Witold; Janicki, Piotr; Laskowski, Zbigniew; Madalinski, Kazimierz; and Dabrowa, Andrzej, 4,558,011, Cl. 435-272.000.

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Bernardi, Luigi; Lazzari, Ettore; Malnati, Maria L.; Mazzini, Giuseppe; Pegrassi, Lorenzo; and Rossi, Alessandro, 4,558,049, Cl. 514-234.000.

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Schneider, Hartmut; and Lebetzki, Egon, 4,557,561, Cl. 350-96.340.

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Lee, Joseph C., to United States of America, Air Force. Compact broadband rectangular to coaxial waveguide junction. 4,558,290, Cl. 333-126.000.
Lee, Robert G. H.: *See*—
Savard, Guy; and Lee, Robert G. H., 4,557,329, Cl. 166-261.000.
Lee, Shaw-Guang: *See*—
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Leemhuis, Louis J. Energy conservation conditioned air system. 4,557,418, Cl. 236-49.000.
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Bernard, Jean; Beyl, Jean; Briee, Serge; and le Faou, Daniel, 4,557,499, Cl. 280-626.000.
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Knebel, Michael; and Schulein, Rolf G., 4,557,012, Cl. 15-116.00R.
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Nix, Richard A.; and Leigh-Monstevens, Keith V., 4,557,361, Cl. 192-85.00C.
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Leland Stanford Junior University, Board of Trustees of the: *See*—
Newton, Steven A.; and Cutler, Cassius C., 4,557,552, Cl. 350-96.150.
Lenz, Werner: *See*—
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Tybring, Leif, 4,557,932, Cl. 424-114.000.
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Randin, Jean-Claude, 4,557,690, Cl. 433-49.000.
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Levine, James L.: *See*—
Garwin, Richard L.; and Levine, James L., 4,558,313, Cl. 340-709.000.
Levine, Norman D. Heavy bag stand. 4,557,478, Cl. 272-78.000.
Levitt, George: *See*—
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Levy, Roger: *See*—
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Lewis, Wallace J.; and Bolser, David R., to McDonnell Douglas. Heat pipe fabrication. 4,557,413, Cl. 228-183.000.
Leytus, Stephen: *See*—
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Liggett, Julian M.: *See*—
Smith, Jimmy B.; and Liggett, Julian M., 4,557,733, Cl. 44-10.00C.
Light Signatures, Inc.: *See*—
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Lilliwyte Societe Anonyme: *See*—
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Lilly Industries Limited: *See*—
Corfield, John R.; and Miller, Andrew S., 4,558,124, Cl. 544-22.000.
Lin, Ta C. Elbow of staircase hand rail. 4,557,467, Cl. 256-59.000.
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Fuller, Gene E.; and Lin, Yi-Ching, 4,557,797, Cl. 156-643.000.
Lindanl, Ake R.; and Erlandsson, Stig A. B., to AB Ferrosan. Membrane-coated sustained-release tablets and method. 4,557,925, Cl. 424-19.000.
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Probst, Karl; and Hufken, Kurt, 4,557,421, Cl. 241-73.000.
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Lindl, Thomas A.: *See*—
Hatzenbuhler, John R.; and Lindl, Thomas A., 4,558,093, Cl. 524-837.000.
Lindley, John E. Apparatus for removing noxious fumes and gases from a commode bowl and preventing their escape to the immediate vicinity. 4,556,999, Cl. 4-217.000.
Lindsay, Frederick E.; and Alexander, Willis R., to Mack Trucks, Inc. Centrifugal filter assembly. 4,557,831, Cl. 210-232.000.
Lindsay, Richard A., to W. Vinten Limited. Load counterbalancing mechanisms. 4,557,459, Cl. 248-571.000.
Link, Werner, to Wilhelm Link GmbH & Co. KG. Gas pressure spring with a safety device. 4,557,470, Cl. 267-64.120.
Linn, Maynard W. Binding unit. 4,557,503, Cl. 281-47.000.
Litherland, James A. F., to Hillman Newby Ltd. Hydraulic seal with pressure-actuated ridges. 4,557,488, Cl. 277-27.000.
Litterst, Ralph S. Electric fluid heater having combined heating and flow control mechanism. 4,558,207, Cl. 219-308.000.
Litton Systems, Inc.: *See*—
Schlang, Arthur, 4,558,461, Cl. 382-9.000.
Litzinger, Elmer F., Jr., to Brown & Williamson Tobacco Corporation. Filtered cigarette. 4,557,281, Cl. 131-336.000.
Llerandi, Ulises. Ornamental harness with lighting effects. 4,558,403, Cl. 362-806.000.
Lo, Wing C.: *See*—
Fortino, Placido S.; Haas, Laird K. S.; Hong, Siu-Ping; Lo, Wing C.; and Neupauer, Edward J., 4,558,390, Cl. 361-119.000.
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Lofquist, Robert A.; Twilley, Ian C.; and Saunders, Peter R., to Allied Corporation. Nylon comfort fiber containing poly(N,N-dimethylacrylamide). 4,558,097, Cl. 525-183.000.
Longacre, James R.: *See*—
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Longenderfer, John E.; Luchaco, David G.; and Capewell, Dennis, to Lutron Electronics Co., Inc. Load switching arrangement for gas discharge lamp circuit. 4,558,262, Cl. 315-307.000.
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Lopez, Jaime; McKinney, Joel D.; and Pasek, Eugene A., to Gulf Research & Development Company. Heavy oil hydroprocessing. 4,557,821, Cl. 208-108.000.
Lorentz, Donald G., to Westinghouse Electric Corp. Process for removal of dissolved oxygen from steam generation systems. 4,557,835, Cl. 210-748.000.
Lork, Winfried: *See*—
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Lowenschuss, Oscar, to Raytheon Company. Digital frequency synthesizer. 4,558,282, Cl. 328-14.000.
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Golik, Georgy A.; Demchenko, Yaroslav P.; Lozinsky, Miron O.; Malovik, Vladlen V.; and Semeny, Valery Y., 4,557,754, Cl. 71-98.000.
Lucas Industries: *See*—
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Price, Anthony G., 4,557,110, Cl. 60-581.000.

Lucchini, Giuseppe, to Fiat Auto S.p.A. Electric level sensor for motor vehicle fuel tanks. 4,557,144, Cl. 73-313.000.

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Longenderfer, John E.; Luchaco, David G.; and Capewell, Dennis, 4,558,262, Cl. 315-307.000.

Luker, Edward. Lock arrangement for closures. 4,557,394, Cl. 215-317.000.

Lummus Company, The: *See*—
Riegel, Herbert; Huang, Chiung-Yuan; and Strangio, Vincent A., 4,558,167, Cl. 570-238.000.

Lundberg, Gary W., to Boeing Company, The. Cable drive mechanism. 4,557,465, Cl. 254-287.000.

Lundgren, Bengt, to SKF Nova AB. Lockable nut. 4,557,652, Cl. 411-230.000.

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Lutz, Theodore A. Material-handling apparatus. 4,557,658, Cl. 414-517.000.

Luwa AG: *See*—
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Luxtron Corporation: *See*—
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M. E. Cunningham Company: *See*—
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M. Scaglia S.p.A.: *See*—
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Maag Gear-wheel & Machine Company Limited: *See*—
Fischer, Rudolf, 4,557,639, Cl. 407-20.000.

Maag, Hans: *See*—
Holland, George W.; Rosen, Perry; and Maag, Hans, 4,558,142, Cl. 549-465.000.

Mabboux, Michel: *See*—
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Machida, Takayasu: *See*—
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Maclean, Ewen M.; and Spector, George. Modular concept in camper trailer having portable corridor. 4,557,518, Cl. 296-156.000.

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Maddux, Gordon T.: *See*—
Maddux, Irene H.; and Maddux, Gordon T., 4,557,268, Cl. 128-579.00R.

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Maeda, Masahiko; Watanabe, Naotochi; and Fujitani, Kenji, to Showa Denko Kabushiki Kaisha. Vulcanized olefin-based rubber composition. 4,557,859, Cl. 252-511.000.

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Magathan, Paul J.: *See*—
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Magla Products: *See*—
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Magnotta, Frank A., to Dennison Manufacturing Company. Heat transferable laminate. 4,557,964, Cl. 428-187.000.

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Mattsson, Sten I., to Facit Aktiebolag. Printing device. 4,557,193, Cl. 101-93.480.
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McCleerey, Earl W.; and Root, John A., to AMP Incorporated. Key hole retention. 4,557,543, Cl. 339-97.00P.
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McCloskey, Glenn A. Gurney attachment. 4,557,453, Cl. 248-287.000.
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McDermott, William E.; Ellis, David E.; Pchelkin, Nicholas R.; Miller, George W.; Benard, David J.; and Richardson, Ralph J., to United States of America, Air Force. Tubular singlet delta oxygen generator. 4,558,451, Cl. 372-89.000.
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McFarland, Douglas F. Horsepower and fuel consumption gauge. 4,557,140, Cl. 73-114.000.
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McGinnis, Vincent D.: *See*—
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McGonagle, Joseph D.: *See*—
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Gall, Adam F., 4,557,325, Cl. 166-97.000.
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McKenney, John D.: *See*—
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McKinney, Joel D.: *See*—
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McLandrich, Matthew N., to United States of America, Navy. Method of wavelength multiplexing in fused single-mode fiber couplers. 4,557,553, Cl. 350-96.150.
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Meek, Jan; Uittenbogaard, Maurice; Michelsen, Finn C.; and Heerema, Pieter S., deceased (by Heerema, E. P., executor), to Heerema Engineering Service BV. Offshore tower structures. 4,557,629, Cl. 405-204.000.
Meeker, Gregory W.; and Bleck, Norris E., to USM Corporation. Rotary plasticator ram injection machine. 4,557,683, Cl. 425-147.000.
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Mentrup, Anton; Schromm, Kurt; Renth, Ernst-Otto; Muacevic, Gojko; and Fugner, Armin, to Boehringer Ingelheim KG. Bronchospasmolytic 1-(3-methanesulfonamido-4-hydroxyphenyl)-2-[(3-(4-acyl-aminophenyl)-imidazolidin-2-one-1-yl)-alkylamino]-ethanols. 4,558,061, Cl. 514-392.000.
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Miller, Louis D., to RCA Corporation. Image pickup assembly. 4,558,251, Cl. 313-365.000.
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Kuehnl, Charles M., 4,557,238, Cl. 123-492.000.
Mills, David R.: *See*—
Ruck, Nancy C.; Mills, David R.; and Harting, Erik, 4,557,565, Cl. 350-262.000.
Mills, Stuart D.: *See*—
Hargreaves, Rodney B.; McLoughlin, Bernard J.; and Mills, Stuart D., 4,558,045, Cl. 514-222.000.
Mimken, Frederick, to Harris Corporation. Synchronization method and frequency hopping communication system. 4,558,453, Cl. 375-1.000.
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Mine, Taiichi: *See*—
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Minemet Recherche: *See*—
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Ministry of International Trade and Industry: *See*—
Kaneko, Makoto; Tachi, Susumu; and Komoriya, Kiyoshi, 4,558,215, Cl. 250-222.100.
Kikuchi, Keisuke; Morikawa, Takitaro; Shimada, Junichi; and Sakurai, Kenjiro, 4,557,566, Cl. 350-413.000.
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Clark, Henry B., III; and Pike, Myron T., 4,557,837, Cl. 252-8.55C.
Larson, Wayne K., 4,558,149, Cl. 560-14.000.
Ronning, Patricia M.; and Vandesteeg, Gregg A., 4,557,751, Cl. 71-91.000.
Sagawa, Kiyoshi B., 4,558,003, Cl. 430-617.000.
Schaefer, Richard M.; and Tome, James J., 4,557,505, Cl. 283-81.000.
Vernon, Caroline L.; and Stanek, Earl A., 4,557,960, Cl. 428-40.000.
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Takayanagi, Takeshi; Suzuki, Shizuo; Minowa, Susumu; and Nozaki, Yoshihiko, 4,557,316, Cl. 164-517.000.

Misevich, Kenneth W.; and Wilson, John L. A., to Colgate-Palmolive Company. Athletic running shoe. 4,557,059, Cl. 36-32.00R.
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Miyakawa, Nobuhiro; Kokado, Hiroshi; and Inoue, Eiichi, 4,557,856, Cl. 252-500.000.
Mitch, David S.; Abrams, Lloyd W.; Arnold, Jerry L.; Caudill, Forrester; Compton, Thomas A.; and Boston, Steven L., to Armco Inc. Process for controlling zinc vapor in a finishing process for a hot dip zinc based coating on a ferrous base metal strip. 4,557,952, Cl. 427-432.000.
Mitchell, Joan L.; and Pennebaker, William B., to International Business Machines Corporation. Image processing method for graphics images. 4,558,370, Cl. 358-260.000.
Mitsubishi Denki Kabushiki Kaisha: *See—*
Hara, Masanori; Sugawara, Sakuo; Yamazaki, Kisuke; and Kasagi, Hiroshi, 4,557,247, Cl. 126-99.00R.
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Terauchi, Tsuneo; and Masuda, Yoshikazu, 4,557,662, Cl. 414-744.00R.
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Deguchi, Jichio; and Inoue, Takayuki, 4,558,094, Cl. 525-71.000.
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Mitsubishi Rayon Co., Ltd.: *See—*
Kamata, Kazumasa; Nakai, Yoshio; and Shimomura, Yasunori, 4,558,098, Cl. 525-207.000.
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Miyahara, Hatsuo: *See—*
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Miyakawa, Nobuhiro; Kokado, Hiroshi; and Inoue, Eiichi, to Mita Industrial Co., Ltd. Electrically conductive composition for electroresponsive recording materials. 4,557,856, Cl. 252-500.000.
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Miyake, Toshio; Hijiya, Hiromi; Suzuki, Shinji; and Matsumoto, Teruo. Food products and process for producing same. 4,557,927, Cl. 424-48.000.
Miyasaka, Masashi; and Oikawa, Akio, to Nissan Motor Co., Ltd. Striker attachment construction. 4,557,512, Cl. 292-341.180.
Miyashita, Akimi: *See—*
Yamada, Osamu; Murooka, Hideyasu; Ono, Kaoru; and Miyashita, Akimi, 4,557,792, Cl. 156-583.100.
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Mizin, Vladimir G.; Zubarev, Alexei G.; Kolganov, Gennady S.; Volkov, Stanislav S.; Rudnev, Jury A.; Ivashina, Evgeny N.; Blinov, Konstantin A.; and Jugov, Petr I. Steelmaking process. 4,557,758, Cl. 75-51.200.
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Kawashima, Yukio, 4,557,060, Cl. 36-44.000.
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Mobay Chemical Corporation: *See—*
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Horodysky, Andrew G., 4,557,844, Cl. 252-49.900.
Horodysky, Andrew G.; and Landis, Phillip S., 4,557,845, Cl. 252-49.900.
Valyocsik, Ernest W.; and Derouane, Eric G., 4,557,917, Cl. 423-328.000.
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Mochizuki, Hirohiko: *See—*
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Modic, Frank J.: *See—*
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Modone, Eros, to CSELT - Centro Studi e Laboratori Telecomunicazioni S.p.A. Process for producing substances optically transparent to infrared rays. 4,557,914, Cl. 423-303.000.
Mogami, Takeo; and Saeki, Michio, to Yamatake-Honeywell Co., Ltd. Controller of digital control system and method for controlling the same. 4,558,430, Cl. 364-900.000.
Mohr, Reinhard: *See—*
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Moles, Robert G. H.: *See—*
Goss, Gary J.; Moles, Robert G. H.; and Hinrichs, Randall D., 4,558,409, Cl. 364-200.000.
Molina, Jorge W., to Deutsch Fastener Corp. Fastener retention with improved fatigue life. 4,557,650, Cl. 411-108.000.
Molitor, Jerome A. Rope-holding boat hook. 4,557,214, Cl. 114-221.00R.
Monsanto Company: *See—*
Higginbottom, Harold P.; and Drumm, Manuel F., 4,557,979, Cl. 428-460.000.
Holtrop, James S.; and Maurer, Richard P., 4,557,970, Cl. 428-316.600.
Nelson, G. Douglas; and Vazopolos, Steve, 4,557,926, Cl. 424-19.000.
Montana, Frank J., to Bisco Products, Inc. Flue gas duct assembly. 4,557,297, Cl. 138-141.000.
Montierth, Max R., to Corning Glass Works. Apparatus for fabrication of solid particulate filters. 4,557,682, Cl. 425-121.000.
Moore, Douglas G.: *See—*
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Moore, James E., to General Electric Company. Photocurable acrylate-acrylonitrile coated plastic articles. 4,557,975, Cl. 428-412.000.
Moore, Kelly R.: *See—*
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Moores, Gregory E.: *See—*
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Moren, Rolf R., to Santrade Ltd. Rotary drill bit. 4,557,609, Cl. 384-94.000.
Mori, Hidetomo; Matsushita, Osami; Matsubara, Katsumi; Ida, Michiaki; and Sasaki, Shigeru, to Hitachi, Ltd. Rotary fluid machine with thrust bearing mounting unit. 4,557,679, Cl. 418-201.000.
Mori, Hirotaro; and Fujita, Hiroshi, to Osaka University. Method for amorphization of a metal crystal. 4,557,765, Cl. 148-4.000.
Mori, Motokuni: *See—*
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Mori, Seiji: *See—*
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Morikawa, Takitaro: *See—*
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Morikawa, Yuichi; Saito, Kazuo; Amada, Eiichi; and Shirasu, Hirotoshi, to Nippon Telegraph & Telephone Public Corp.; and Hitachi, Ltd. Subscriber line interface circuit with complex impedance. 4,558,185, Cl. 179-170.0NC.

Morimoto, Yoshiro: *See*—
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Morisawa, Tahei: *See*—
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Morishita, Toshio; Yasui, Yoshiharu; Suzuki, Yoshihisa; Seiki, Kazuo; and Nakamura, Haruyoshi, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Drafting means for textile machine such as spinning machine. 4,557,022, Cl. 19-267.000.
Morita, Yukichi; Ono, Koji; Ogata, Eiji; and Manabe, Osamu, to Konishi Chemical Industry Co., Ltd. Process for preparing halo-substituted diarylsulfones. 4,558,161, Cl. 568-34.000.
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Morooka, Koji: *See*—
Kihara, Kunio; Toda, Hideo; Mori, Motokuni; and Morooka, Koji, 4,557,930, Cl. 424-79.000.
Morse, Albert I., to USM Corporation. Hopper feed mechanism. 4,557,402, Cl. 222-230.000.
Morton, Donald L.: *See*—
Irie, Reiko F.; Tai, Tadashi; Morton, Donald L.; Cahan, Leslie D.; and Paulson, James C., 4,557,931, Cl. 424-88.000.
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Goodman, Louis P., 4,557,942, Cl. 426-574.000.
Motoki, Kenichi; and Ushiroyama, Nobuyasu, to Honda Giken Kogyo Kabushiki Kaisha. Arrangement of connecting a diaphragm with an actuator rod in a diaphragm-operated device. 4,557,671, Cl. 417-328.000.
Motonami, Masanao; Yamada, Makoto; and Ogawa, Hisashi, to Toyota Jidosha Kabushiki Kaisha. Automatic seat belt device. 4,557,523, Cl. 297-468.000.
Motorola, Inc.: *See*—
Edwards, David W., 4,558,231, Cl. 307-271.000.
Helda, Robert W., deceased; Halextine, Cynthia, personal representative; and Liaw, H. Ming, 4,557,795, Cl. 156-617.0SP.
Neidorff, Robert A., 4,558,286, Cl. 330-252.000.
Motoyama, Akira: *See*—
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Mount, Wilbur S. Expansion chamber devices. 4,557,182, Cl. 92-90.000.
M'Sadoques, Andre J.; and Sabatella, Robert J., to General Electric Company. Retainer for molded case circuit breakers. 4,557,047, Cl. 29-854.000.
MTU Motoren und Turbinen-Union Friedrichshafen GmbH: *See*—
Haussmann, Gerhard; and Kamleitner, Ewald, 4,557,111, Cl. 60-600.000.
Muacevic, Gojko: *See*—
Mentrup, Anton; Schromm, Kurt; Renth, Ernst-Otto; Muacevic, Gojko; and Fugner, Armin, 4,558,061, Cl. 514-392.000.
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Muenzner, Wulf: *See*—
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Mukasa, Koichi: *See*—
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Mullenberg, Ralph. Clamping device. 4,557,621, Cl. 403-16.000.
Muller, Hans; and May, Stefan, to GAO Gesellschaft fur Automation und Organisation mbH. Method of screening half-tone picture themes. 4,557,596, Cl. 355-132.000.
Mumper, James O.: *See*—
Hecock, J. Edwin; and Mumper, James O., 4,557,409, Cl. 227-147.000.
Munch, Werner: *See*—
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Murakami, Tokumichi, to Mitsubishi Denki Kabushiki Kaisha. Vector quantizer. 4,558,350, Cl. 358-21.00R.
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Pittet, Alan O.; Muralidhara, Ranya; and Vock, Manfred H., 4,557,941, Cl. 426-535.000.
Muranaka, Akio: *See*—
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Murayama, Akira; Kuno, Hiroaki; Uchikawa, Naoshi; Tamura, Takahiro; Mizuno, Takao; Kotani, Sumihisa; Tomita, Yoshikatsu; Arata, Tetsuya; Shiibayashi, Masao; and Suefuji, Kazutaka, to Hitachi, Ltd. Scroll-type fluid machine with back pressure chamber biasing an orbiting scroll member. 4,557,675, Cl. 418-55.000.
Murooka, Hideyasu: *See*—
Yamada, Osamu; Murooka, Hideyasu; Ono, Kaoru; and Miyashita, Akimi, 4,557,792, Cl. 156-583.100.
Murphy, Jack W.: *See*—
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Murray, Barbara: *See*—
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Murray, Kenelm G. D.: *See*—
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Musashi Engineering Kabushiki Kaisha: *See*—
Iwama, Takasuke, 4,557,597, Cl. 356-71.000.
Mussmann, Bernd, to Dragerwerk A.G. Testing tube and testing tube filter assembly therefor. 4,557,902, Cl. 422-59.000.
Muterspaugh, Max W., to RCA Corporation. Bias and AGC control of two RF amplifiers with a shared control element. 4,558,289, Cl. 330-278.000.
N Gueyen, Huu-Can, to Equipements Automobiles Marchal. Cooling device for an internal combustion engine. 4,557,223, Cl. 123-41.120.
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Bresser, Onno R., 4,557,558, Cl. 350-96.230.
Nadamoto, Hiroyasu: *See*—
Kondo, Hiroshi; Nadamoto, Hiroyasu; and Takamatsu, Yoshikazu, 4,557,324, Cl. 165-174.000.
Nagae, Akimitsu: *See*—
Kanematsu, Hiroyuki; Nagae, Akimitsu; and Sano, Shinji, 4,558,419, Cl. 364-474.000.
Nagahara, Yoshikazu; and Inaba, Nobuaki, to Kabushiki Kaisha Komatsu Seisakusho. Brake for a hydraulic motor. 4,557,109, Cl. 60-436.000.
Nagai, Isao: *See*—
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Nagano, Tamio, to Kabushiki Kaisha Daikin Seisakusho. Clutch disc. 4,557,362, Cl. 192-106.200.
Nagano, Teruo; Nakakita, Eiji; and Sekiya, Toshiyuki, to Fuji Photo Film Co., Ltd. Light-sensitive printing plate with patterned matting layer. 4,557,994, Cl. 430-162.000.
Nagano, Tsutomu, to Kitz Corporation. Ball valve with emergency sealing device. 4,557,286, Cl. 137-74.000.
Nagase, Kaneomi: *See*—
Itakura, Gen; Kuramitsu, Hideki; Iguchi, Takashi; Kuroda, Takayuki; and Nagase, Kaneomi, 4,558,020, Cl. 501-137.000.
Nagel, Peter: *See*—
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Nagumo, Fumio, to Sony Corporation. Smear reduction in solid state television camera. 4,558,366, Cl. 358-213.000.
Nahara, Akira: *See*—
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Nakagawa, Akira: *See*—
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Nakagawa, Katsumi; Komatsu, Toshiyuki; Hirai, Yutaka; Misumi, Teruo; and Fukuda, Tadaji, to Canon Kabushiki Kaisha. Hydrogenated amorphous silicon photosensitive member for electrophotography. 4,557,990, Cl. 430-84.000.
Nakagawa, Katsumi; Mochizuki, Noritaka; Komatsu, Toshiyuki; Fukaya, Masaki; and Kuno, Mitsutoshi, to Canon Kabushiki Kaisha. Color image reading method and apparatus. 4,558,357, Cl. 358-75.000.
Nakagawa, Kiyoshi: *See*—
Matsumoto, Tadayuki; Imaeda, Kozo; Mineo, Masatoshi; and Nakagawa, Kiyoshi, 4,557,026, Cl. 28-258.000.
Nakahama, Ryoji, to Sanshin Kogyo Kabushiki Kaisha. Tilt mechanism for marine propulsion device. 4,557,696, Cl. 440-61.000.
Nakahara, James H.: *See*—
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Nakahata, Kimio: *See*—
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Nakai, Yoshio: *See*—
Kamata, Kazumasa; Nakai, Yoshio; and Shimomura, Yasunori, 4,558,098, Cl. 525-207.000.
Nakajima, Fumio: *See*—
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Nakajima, Kunio: *See*—
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Nakajima, Mutsuo: *See*—
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Nakajima, Yukio, to Olympus Optical Co., Ltd. Automatic focussing apparatus. 4,557,579, Cl. 354-402.000.
Nakakita, Eiji: *See*—
Nagano, Teruo; Nakakita, Eiji; and Sekiya, Toshiyuki, 4,557,994, Cl. 430-162.000.
Nakamori, Tutomu, to Fujitsu Limited. CMOS power-on reset pulse generating circuit with extended reset pulse duration. 4,558,233, Cl. 307-362.000.
Nakamura, Haruyoshi: *See*—
Morishita, Toshio; Yasui, Yoshiharu; Suzuki, Yoshihisa; Seiki, Kazuo; and Nakamura, Haruyoshi, 4,557,022, Cl. 19-267.000.

Nakamura, Kazuhiro: *See*—
Koyama, Etsuo; and Nakamura, Kazuhiro, 4,558,443, Cl. 369-139.000.

Nakamura, Mamoru: *See*—
Yamakawa, Masahiro; Nakamura, Mamoru; and Arai, Toyoichi, 4,558,087, Cl. 524-495.000.

Nakamura, Shigehira: *See*—
Tanaka, Shuji; Nakamura, Shigehira; Sakamoto, Tuneaki; Hirakata, Yoshiaki; and Yamagata, Tetsuo, 4,558,460, Cl. 381-86.000.

Nakamura, Takashi, to Mitsubishi Denki Kabushiki Kaisha. Heat pump having improved compressor lubrication. 4,557,115, Cl. 62-156.000.

Nakane, Hisashi: *See*—
Aoyama, Toshimi; Tohda, Hiroyuki; Kato, Kazuo; and Nakane, Hisashi, 4,557,996, Cl. 430-324.000.

Nakanishi, Keiichirou: *See*—
Yamada, Minoru; Masaki, Akira; Yamamoto, Masakazu; Nakanishi, Keiichirou; Nishida, Takashi; Daikoku, Takahiro; Kobayashi, Fumiyuki; and Imai, Kuninori, 4,558,395, Cl. 361-385.000.

Nakano, Tsunetomo; Yasuno, Hiroshi; and Nishio, Kazuaki, to UBE Industries, Ltd. Organic solvent-soluble photosensitive polyimide resin. 4,558,117, Cl. 528-184.000.

Nakase, Ryoichi, to Sanshin Kogyo Kabushiki Kaisha. Swivel bracket holding mechanism for marine propulsion device. 4,557,460, Cl. 248-642.000.

Nakashima, Keishi: *See*—
Shimada, Yutaka; Mukasa, Koichi; Hatanai, Takashi; and Nakashima, Keishi, 4,557,769, Cl. 148-31.550.

Nakashima, Seiichiro; Torii, Nobutoshi; and Hamura, Masayuki, to Fanuc Ltd. Robot hand. 4,557,660, Cl. 414-730.000.

Nakashio, Miaki: *See*—
Narabu, Tadakuni; and Nakashio, Miaki, 4,558,341, Cl. 357-24.000.

Nakaso, Akishi; Okamura, Toshiro; Yamanoi, Kiyoshi; and Nakajima, Sumiko, to Hitachi Chemical Company. Electroless copper plating solution. 4,557,762, Cl. 106-1.230.

Nakayama, Kazuaki, to Pioneer Electronic Corporation. Emitter-follower type SEPP circuit. 4,558,288, Cl. 330-268.000.

Namordi, Mooshi R.: *See*—
White, William A.; and Namordi, Mooshi R., 4,558,235, Cl. 307-450.000.

Narabu, Tadakuni; and Nakashio, Miaki, to Sony Corporation. Charge transfer with meander channel. 4,558,341, Cl. 357-24.000.

Narimatsu, Akihisa: *See*—
Yonemoto, Hiroshi; Narimatsu, Akihisa; and Suzuki, Nobuyuki, 4,558,312, Cl. 340-680.000.

Naruo, Kyoichi: *See*—
Yamamoto, Nobuyuki; Yabe, Masao; Nishikawa, Yasuo; Yanai, Akio; Shirahata, Ryuji; and Naruo, Kyoichi, 4,557,948, Cl. 427-131.000.

Nash, Ronald S.; and Cash, L. Dale, to Fiber Controls Corporation. Laying out and opening of fiber bales. 4,557,021, Cl. 19-80.00R.

National Information Utilities Corporation: *See*—
Hills, Michael T.; and Heinrich, Raymond L., 4,558,454, Cl. 375-18.000.

National Research Development Corporation: *See*—
Goodridge, Francis; Plimley, Raymond E.; and Wright, Allen R., 4,557,812, Cl. 204-130.000.

Navarre, Robert L. Continuous sequential casting apparatus. 4,557,313, Cl. 164-155.000.

Nawamaki, Tsutomu: *See*—
Tanaka, Norio; Taniguchi, Masakazu; Baba, Masatoshi; Ikai, Takashi; Nawamaki, Tsutomu; and Matsunaga, Masaji, 4,557,753, Cl. 71-92.000.

Naylor, Carter G.: *See*—
McCoy, David R.; and Naylor, Carter G., 4,558,159, Cl. 564-233.000.

NCR Canada Ltd. - NCR Canada LTEE: *See*—
Pecak, Tadeusz, 4,557,473, Cl. 271-229.000.

Neal, Hubert W. T., to SKF (U.K.) Limited. Seals for bearings. 4,557,612, Cl. 384-488.000.

Nec Corporation: *See*—
Sakata, Masanori, 4,558,338, Cl. 357-23.900.
Satoh, Noboru, 4,558,431, Cl. 365-45.000.

Needleman, Philip, to Washington University. Atrial peptides. 4,557,864, Cl. 260-112.50R.

Negishi, Kiyoshi: *See*—
Tano, Eiichi; Kobayashi, Takeo; and Negishi, Kiyoshi, 4,557,575, Cl. 354-289.100.

Negoro, Ikuo, to Asahi Kogaku Kogyo Kabushiki Kaisha. Magnification varying device for copying machine. 4,557,594, Cl. 355-58.000.

Neidorff, Robert A., to Motorola, Inc. Symmetrical diode clamp. 4,558,286, Cl. 330-252.000.

Neil, Iain A., to Barr & Stroud Limited. Infrared radiation detecting systems. 4,558,222, Cl. 250-353.000.

Neil, Joseph S. Vibratory clamping device for use with an excavator in supporting and placing sheeting when excavating in sand, running sand and silt. 4,557,630, Cl. 405-232.000.

Neisen, Gerald F., to Brunswick Corp. No-feedback steering system for marine drives. 4,557,695, Cl. 440-53.000.

Nelson, G. Douglas; and Vazopolos, Steve, to Monsanto Company. Method and tablet for sanitizing toilets. 4,557,926, Cl. 424-19.000.

Nelson, Herbert A. Forced humid aspiration for internal combustion engines. 4,557,222, Cl. 123-25.00B.

Nelson, Philip E.; and Takada, Norihisa, to Purdue Research Foundation. Tomato consistency control apparatus. 4,557,799, Cl. 159-44.000.

Nelson, Roy A. Teaching device and method of using same. 4,557,694, Cl. 434-339.000.

Neomed Inc.: *See*—
Ecanow, Charles S.; and Ecanow, Bernard, 4,558,032, Cl. 514-2.000.

Neumann, Hans-Jurgen; and Meisberger, Artur, to Fresenius AG. Method and apparatus for the separation of media. 4,557,719, Cl. 494-37.000.

Neumann, Harry: *See*—
Ullmann, Werner; Bantle, Max; Neumann, Harry; Seuser, Ulrich H.; and Mathys, Andre, 4,557,075, Cl. 51-58.000.

Neumann, Joachim; Pickert, Detlef; and Emmenthal, Klaus-Dieter, to Volkswagenwerk Aktiengesellschaft. Distribution system for a two-phase fluid mixture. 4,557,874, Cl. 261-19.000.

Neupauer, Edward J.: *See*—
Fortino, Placido S.; Haas, Laird K. S.; Hong, Siu-Ping; Lo, Wing C.; and Neupauer, Edward J., 4,558,390, Cl. 361-119.000.

New Products I, Ltd.: *See*—
Geschwender, Robert C., 4,557,200, Cl. 108-132.000.

New York University: *See*—
John, Erwin R., 4,557,270, Cl. 128-731.000.

Newsome, David L.; Rein, Arnold R.; Hoas, Bradley J.; and Schroeder, George O., to American Can Company. Method of making an oriented polymeric film. 4,557,780, Cl. 156-244.110.

Newsome, Peter M.: *See*—
Beeley, Lee J.; and Newsome, Peter M., 4,558,063, Cl. 514-402.000.

Newton, Steven A.; and Cutler, Cassius C., to Leland Stanford Junior University, Board of Trustees of the. Microbend optical fiber tapped delay line. 4,557,552, Cl. 350-96.150.

NGK Insulators, Ltd.: *See*—
Matsuhiro, Keiji; and Matsui, Minoru, 4,558,018, Cl. 501-97.000.

NGK Spark Plug Co., Ltd.: *See*—
Ito, Masaya; Mori, Seiji; and Ishida, Noboru, 4,557,704, Cl. 464-181.000.

Nibby, Chester M., Jr.: *See*—
Barlow, George J.; Nibby, Chester M., Jr.; and Johnson, Robert B., 4,558,429, Cl. 364-900.000.

Nichols, James D.; Derby, Richard; von dem Bussche, Glenn T.; and Hannum, David A., to Air Products and Chemicals, Inc. Inhibiting acid corrosion of metals. 4,557,838, Cl. 252-8.55C.

Nichols, Richard A., to Rockwell International Corp. Phase shifter for broadband radio signal. 4,558,291, Cl. 333-138.000.

Nickels, Charles J.: *See*—
Lash, Edward G.; Levy, Roger; and Nickels, Charles J., 4,557,129, Cl. 72-176.000.

Nickl, Johann: *See*—
Bronstert, Klaus; Nickl, Johann; Krause, Hans-Joachim; and Schmitt, Werner, 4,558,104, Cl. 526-65.000.

Nicolas, Michel; and Prudhomme, Pierre, to La Telemecanique Electrique. System for distributing pneumatic control signals by electrical means. 4,557,292, Cl. 137-596.160.

Nielsen, Peter B., to F. L. Smidth & Co. A/S. Method and apparatus for calcining pulverulent raw material. 4,557,688, Cl. 432-14.000.

Nigawara, Seiitsu: *See*—
Yanada, Sadao; Honda, Naganobu; Miyagaki, Hisanori; and Nigawara, Seiitsu, 4,558,227, Cl. 290-40.00R.

Nihon Ouyou Kougaku Kabushiki Kaisha: *See*—
Arai, Akira, 4,557,055, Cl. 353-81.000.

Nihon Radiator Co., Ltd.: *See*—
Kondo, Hiroshi; Nadamoto, Hiroyasu; and Takamatsu, Yoshikazu, 4,557,324, Cl. 165-174.000.

Niigata, Kunihiro: *See*—
Imai, Kazuo; Niigata, Kunihiro; Fujikura, Takashi; Hashimoto, Shinichi; and Takenaka, Toichi, 4,558,156, Cl. 564-85.000.

Niino, Shuhei; Ishimura, Koichi; Okamoto, Ken; and Ohba, Koichi, to Mitsubishi Denki Kabushiki Kaisha. Control device for continuous rolling machine. 4,557,126, Cl. 72-16.000.

Nikaido, Akira; Machida, Takayasu; Hirosawa, Yasuhisa; and Nakajima, Fumio, to Citizen Watch Co., Ltd. Micro stepping motor. 4,558,244, Cl. 310-49.00R.

Nilsson, Erling I.: *See*—
Rausing, Anders R.; and Nilsson, Erling I., 4,557,888, Cl. 264-230.000.

Nineuil, Guy, to Rhone-Poulenc Chimie de Base. Production of phosphoric acid. 4,557,915, Cl. 423-319.000.

Nipple, Stephen B., to Kennedy Tank & Manufacturing Company, Inc. Heat exchanger closure system. 4,557,322, Cl. 165-158.000.

Nippon Chemi-Con Corporation: *See*—
Toyama, Tatsuro; and Fujiwara, Masayuki, 4,558,399, Cl. 361-433.000.

Nippon Piston Ring Co., Ltd.: *See*—
Tsuchiya, Takeshi; Samejima, Shuji; and Kimura, Tsutomu, 4,557,492, Cl. 277-216.000.

Nippon Shokubai Kagaku Kogyo Co., Ltd.: *See*—
Tsuneki, Hideaki; Ueshima, Michio; Aoki, Ryuji; and Nagai, Isao, 4,558,028, Cl. 502-211.000.

Nippon Soken, Inc.: *See*—
Inagaki, Mitsuo; Ito, Seitoku; Takeda, Kenji; and Kurokawa, Yoshiki, 4,557,670, Cl. 417-299.000.
Kago, Yoshiyuki; and Akita, Shigeyuki, 4,558,321, Cl. 340-904.000.

Nippon Telegraph & Telephone Public Corp.: *See*—
Kyuragi, Hakaru; and Oikawa, Hideo, 4,557,036, Cl. 29-571.000.
Morikawa, Yuichi; Saito, Kazuo; Amada, Eiichi; and Shirasu, Hirotoshi, 4,558,185, Cl. 179-170.0NC.

Nippon Zeon Co. Ltd.: *See*—
Yamakawa, Masahiro; Nakamura, Mamoru; and Arai, Toyoichi, 4,558,087, Cl. 524-495.000.
Nippondenso Co., Ltd.: *See*—
Akiyama, Susumu; Ito, Kenzo; Fukaya, Hiroyasu; Ogiso, Haruhiko; Hirabayashi, Yuji; and Kawamura, Takahide, 4,558,417, Cl. 364-431.110.
Inagaki, Mitsuo; Ito, Seitoku; Takeda, Kenji; and Kurokawa, Yoshiki, 4,557,670, Cl. 417-299.000.
Kashima, Osamu; and Shibata, Masamichi, 4,557,229, Cl. 123-169.0EL.
Masegi, Mitsuhiko, 4,558,260, Cl. 315-82.000.
Nishida, Hiroshi; Hizawa, Kouichi; and Mine, Taiichi, to Japan Tobacco & Salt Public Corporation, The. Apparatus for supplying cardboards. 4,557,698, Cl. 414-330.000.
Nishida, Takashi: *See*—
Yamada, Minoru; Masaki, Akira; Yamamoto, Masakazu; Nakanishi, Keiichirou; Nishida, Takashi; Daikoku, Takahiro; Kobayashi, Fumiyuki; and Imai, Kuninori, 4,558,395, Cl. 361-385.000.
Nishihara, Toshio: *See*—
Yamanashi, Yoshihiro; Okuma, Minoru; Hata, Masahito; and Nishihara, Toshio, 4,557,711, Cl. 474-900.000.
Nishikawa, Yasuo: *See*—
Yamamoto, Nobuyuki; Yabe, Masao; Nishikawa, Yasuo; Yanai, Akio; Shirahata, Ryuji; and Naruo, Kyoichi, 4,557,948, Cl. 427-131.000.
Nishimura, Shinji, to Mitsubishi Denki Kabushiki Kaisha. Pump device. 4,557,678, Cl. 418-180.000.
Nishimura, Tsugio, to Mitsubishi Denki Kabushiki Kaisha. Apparatus for the inspection of electrodeposited electrically insulating coatings. 4,558,273, Cl. 324-54.000.
Nishio, Kazuaki: *See*—
Nakano, Tsunetomo; Yasuno, Hiroshi; and Nishio, Kazuaki, 4,558,117, Cl. 528-184.000.
Nishkawa, Yuji: *See*—
Kunieda, Hiroshi; Yamamoto, Hiroshi; Nishkawa, Yuji; and Enpuku, Yoshihiko, 4,557,897, Cl. 422-15.000.
Nissan Chemical Industries Ltd.: *See*—
Tanaka, Norio; Taniguchi, Masakazu; Baba, Masatoshi; Ikai, Takashi; Nawamaki, Tsutomu; and Matsunaga, Masaji, 4,557,753, Cl. 71-92.000.
Nissan Motor Co., Ltd.: *See*—
Etoh, Yukihiro; Tanaka, Toshiaki; Kanesaki, Nobukazu; and Miyazaki, Hiroaki, 4,557,230, Cl. 123-263.000.
Miyasaka, Masashi; and Oikawa, Akio, 4,557,512, Cl. 292-341.180.
Noso, Kazunori; Kishi, Norimasa; and Futami, Toru, 4,558,459, Cl. 381-43.000.
Tanaka, Yoshikazu; Yamamuro, Sigeaki; Abo, Keiju; Hirano, Hiroyuki; Kumura, Haruyoshi; and Morimoto, Yoshiro, 4,557,706, Cl. 474-28.000.
Nissin Kogyo Kabushiki Kaisha: *See*—
Takeuchi, Hiroo; Hachiro, Nobuaki; and Miyazaki, Yoshihisa, 4,557,179, Cl. 91-369.00A.
Nix, Richard A.; and Leigh-Monstevens, Keith V., to Automotive Products plc. Shipping and installation strap for linear actuator. 4,557,361, Cl. 192-85.00C.
Nixdorf Computer A.G.: *See*—
Rittmeister, Hubert; and Seroka, Karl-Heinz, 4,557,072, Cl. 49-27.000.
Noaillac, Jean R.: *See*—
Berthet, Jeanne; Blin, Marie-Francoise; Gaussens, Gilbert; and Noaillac, Jean R., 4,557,749, Cl. 71-64.110.
Nobuta, Yasuo: *See*—
Katsumata, Kenichiro; and Nobuta, Yasuo, 4,558,458, Cl. 378-20.000.
Noguchi, Masahiro: *See*—
Enjo, Naonori; Noguchi, Masahiro; and Ide, Satoshi, 4,557,851, Cl. 252-70.000.
Nomura, Noboru: *See*—
Kaminaka, Nobuyuki; Kanai, Kenji; and Nomura, Noboru, 4,558,385, Cl. 360-126.000.
Nomura, Yukihiro: *See*—
Sugisawa, Ko; Yamamoto, Masanori; Shibuki, Masaru; Nomura, Yukihiro; Sengoku, Koji; Higashine, Seiji; and Hioki, Hiroko, 4,557,939, Cl. 426-473.000.
Nordischer Maschinenbau Rud. Baader GmbH & Co. KG: *See*—
Wenzel, Werner, 4,557,020, Cl. 17-55.000.
Noso, Kazunori; Kishi, Norimasa; and Futami, Toru, to Nissan Motor Company, Limited. Speech recognition system for an automotive vehicle. 4,558,459, Cl. 381-43.000.
Nouda, Hiroshi; Hasegawa, Kinji; and Hosoi, Masahiro, to Teijin Limited. Magnetic recording flexible disc. 4,557,982, Cl. 428-694.000.
Novacor Medical Corporation: *See*—
Chen, Herbert; and Conley, Michael G., 4,557,673, Cl. 417-412.000.
Novick, Leonard R., to United States of America, Air Force. Applique rate converter. 4,558,445, Cl. 370-84.000.
Novotny, Rudolf: *See*—
Christophliemk, Peter; von Laufenberg, Jurgen; Novotny, Rudolf; Staller, Siegfried; and Diekotter, Friedrich W., 4,557,907, Cl. 423-119.000.
Nowack, Gerhard P.: *See*—
Johnson, Marvin M.; and Nowack, Gerhard P., 4,558,165, Cl. 568-698.000.
Nozaki, Yoshihiko: *See*—
Takayanagi, Takeshi; Suzuki, Shizuo; Minowa, Susumu; and Nozaki, Yoshihiko, 4,557,316, Cl. 164-517.000.
Nunheimer, Thomas P.: *See*—
Talbert, Sherwood G.; Flanigan, Lawrence J.; Corliss, John M.; Hagopian, John G.; and Nunheimer, Thomas P., 4,557,253, Cl. 126-429.000.
Nutter, Dale E. Gas-liquid contact apparatus and method of making it. 4,557,876, Cl. 261-94.000.
Nygren, B. Hakan; Sandstrom, E. Torbjorn; Stenberg, Johan E.; and Stiblert, Lars B., to Sagax Instrument AB. Method and member for detecting and/or measuring the concentration of a chemical substance. 4,558,012, Cl. 436-501.000.
Obedineni Zavodi za Zapametyavashti Ustroystva: *See*—
Atanassov, Lyuben P.; Kohen, Eliezer H.; Maleshkov, Vladimir D.; Antonov, Dimo P.; Russev, Lyubomir S.; and Georgiev, Georgi A., 4,558,408, Cl. 364-130.000.
O'Brien, Thomas E., Jr., to General Instrument Corporation. Address-programmable CATV converter. 4,558,464, Cl. 455-4.000.
Ochi, Shigeharu, to Fuji Photo Film Co., Ltd. High-resolution high-sensitivity solid-state imaging sensor. 4,558,365, Cl. 358-212.000.
Odell, Peter G.: *See*—
Alexandru, Lupu; and Odell, Peter G., 4,558,108, Cl. 526-340.000.
Oehler, Oskar; and Fries, Alexis. Detection means for the selective detection of gases, based on optical spectroscopy. 4,557,603, Cl. 356-418.000.
Oestmann, Eldon D., to Caterpillar Tractor Co. Vehicle steering differential. 4,557,157, Cl. 74-607.000.
Officine Vezzani S.p.A.: *See*—
Vezzani, Luciano, 4,557,190, Cl. 100-98.00R.
Offidani, Ralph V., to GNB Batteries Inc. Adapter guide for air supply tube. 4,557,984, Cl. 429-67.000.
Ogata, Eiji: *See*—
Morita, Yukichi; Ono, Koji; Ogata, Eiji; and Manabe, Osamu, 4,558,161, Cl. 568-34.000.
Ogata, Mikito: *See*—
Banba, Fumiyasu; and Ogata, Mikito, 4,558,446, Cl. 371-10.000.
Ogawa, Akira: *See*—
Aoki, Kozo; Ogawa, Akira; and Tanabe, Osami, 4,557,999, Cl. 430-385.000.
Ogawa, Hisashi: *See*—
Motonami, Masanao; Yamada, Makoto; and Ogawa, Hisashi, 4,557,523, Cl. 297-468.000.
Ogiso, Haruhiko: *See*—
Akiyama, Susumu; Ito, Kenzo; Fukaya, Hiroyasu; Ogiso, Haruhiko; Hirabayashi, Yuji; and Kawamura, Takahide, 4,558,417, Cl. 364-431.110.
Oguchi, Yukio; and Yasukawa, Kazuyoshi, to Kabushiki Kaisha Sankyo Seiki Seisakusho. Robot control apparatus. 4,558,424, Cl. 364-513.000.
O'Hara, Kevin J.: *See*—
Wright, Alan J.; O'Hara, Kevin J.; and Turner, Stephen K., 4,558,076, Cl. 523-442.000.
Ohara, Seishichi, to Clarion Co., Ltd. Auto device mounting structure. 4,557,445, Cl. 248-27.100.
Ohara, Terumi: *See*—
Takanashi, Itsuo; Tanaka, Hideshi; Tsumiyama, Hisanori; Mizuno, Yoshio; Ohara, Terumi; Kato, Shigeru; Takahasi, Toshinori; and Kiuchi, Tsutomu, 4,558,328, Cl. 346-76.0PH.
Ohashi, Shinichi: *See*—
Shibata, Akira; and Ohashi, Shinichi, 4,558,378, Cl. 360-19.100.
Ohba, Koichi: *See*—
Niino, Shuhei; Ishimura, Koichi; Okamoto, Ken; and Ohba, Koichi, 4,557,126, Cl. 72-16.000.
Ohkubo, Hideo, to Diesel Kiki Co., Ltd. Centrifugal injection timing control device for fuel injection pumps. 4,557,239, Cl. 123-501.000.
Ohkuma, Yuji, to Fujitsu Limited. Apparatus for wet processing. 4,557,785, Cl. 156-345.000.
Ohmachi, Yuko: *See*—
Koyama, Mikio; Okaniwa, Kenichiro; Saruhashi, Masakuni; and Ohmachi, Yuko, 4,557,901, Cl. 422-56.000.
Ohmi, Akira: *See*—
Hata, Takuoki; Ohmi, Akira; Ushijima, Tadayoshi; and Kuroda, Takayuki, 4,558,021, Cl. 501-137.000.
Ohmori, Akira; Tomihashi, Nobuyuki; and Kitahara, Takahiro, to Daikin Kogyo Co., Ltd. Copolymers for optical fibers. 4,557,562, Cl. 350-96.340.
Ohmori, Takashi: *See*—
Kurata, Masami; and Ohmori, Takashi, 4,558,374, Cl. 358-287.000.
Ohnuma, Toshio: *See*—
Suzuki, Fumio; Ohnuma, Toshio; Koga, Kazuyuki; and Watanabe, Tatsuya, 4,557,046, Cl. 29-749.000.
Ohtsuki, Tomonari; and Hirose, Takao, to Allied Corporation. Shielded electrical connector. 4,557,545, Cl. 339-103.00M.
Ohuchi, Yutaka: *See*—
Hatayama, Katsuo; Yoshikawa, Kensei; Sano, Tatsuhiko; Ohuchi, Yutaka; Ota, Tomomi; Sekiuchi, Kazuto; and Sota, Kaoru, 4,557,871, Cl. 556-183.000.
Oikawa, Akio: *See*—
Miyasaka, Masashi; and Oikawa, Akio, 4,557,512, Cl. 292-341.180.
Oikawa, Hideo: *See*—
Kyuragi, Hakaru; and Oikawa, Hideo, 4,557,036, Cl. 29-571.000.
Oiles Industry Co., Ltd.: *See*—
Kitta, Toshiyuki; and Abe, Wataru, 4,557,087, Cl. 52-230.000.
Oishi, Kengo: *See*—
Komiyama, Choji; Oishi, Kengo; Suzuki, Osamu; and Iyota, Yasumasa, 4,557,380, Cl. 206-387.000.
Ojima, Teruhiko: *See*—
Shigeta, Masao; and Ojima, Teruhiko, 4,558,297, Cl. 336-213.000.

Okamoto, Ken: *See*—
Niino, Shuhei; Ishimura, Koichi; Okamoto, Ken; and Ohba, Koichi, 4,557,126, Cl. 72-16.000.
Okamoto, Miyoshi; Iijima, Hiromichi; and Miyoshi, Akito, to Toray Industries, Inc. Ultrafine sheath-core composite fibers and composite sheets made thereof. 4,557,972, Cl. 428-373.000.
Okamura, Edward T., Sr. Convertible sunvisor cap. 4,556,993, Cl. 2-196.000.
Okamura, Hisashi: *See*—
Yokoyama, Shigeki; Okamura, Hisashi; Maekawa, Yukio; and Kawasaki, Hiroshi, 4,558,001, Cl. 430-527.000.
Okamura, Toshiro: *See*—
Nakaso, Akishi; Okamura, Toshiro; Yamanoi, Kiyoshi; and Nakajima, Sumiko, 4,557,762, Cl. 106-1.230.
Okaniwa, Kenichiro: *See*—
Koyama, Mikio; Okaniwa, Kenichiro; Saruhashi, Masakuni; and Ohmachi, Yuko, 4,557,901, Cl. 422-56.000.
Okazaki, Takao: *See*—
Haneishi, Tatsuo; Okazaki, Takao; Torikata, Akio; Nakajima, Mutsuo; Enokita, Ryuzou; Katayama, Toshiaki; and Iwado, Seigo, 4,557,933, Cl. 424-118.000.
Okazaki, Takuya: *See*—
Kan, Masanori; Okazaki, Takuya; and Sakashita, Tatsuo, 4,558,088, Cl. 524-505.000.
Okuma, Minoru: *See*—
Yamanashi, Yoshihiro; Okuma, Minoru; Hata, Masahito; and Nishihara, Toshio, 4,557,711, Cl. 474-900.000.
Olds, Delbert L.: *See*—
Brod, William B.; Coppala, George H.; and Olds, Delbert L., 4,557,904, Cl. 422-146.000.
Olin Corporation: *See*—
Winter, Joseph, 4,557,559, Cl. 350-96.230.
Olinger, Dean E.; and Harding, Robert A., to Clawson Tank Company. Storage and shipping bin. 4,557,406, Cl. 222-564.000.
Olive, Robert B.: *See*—
Codd, Roger D.; Sims, Ronald I.; Olive, Robert B.; and Jobanputra, Amit S., 4,558,281, Cl. 324-433.000.
Olmsted, Robert W.; and Huth, Joseph F., III, to Spang & Company. Tunable-inductance magnetically-soft ferrite core structures. 4,558,295, Cl. 336-83.000.
Olsen, Robert C.: *See*—
Weaver, William N.; and Olsen, Robert C., 4,557,375, Cl. 206-151.000.
Olson, Donald M.; Jackson, Norman L.; and Tong, Jerry E., to Advanced Semiconductor Materials America, Inc. Article handling apparatus and method. 4,557,657, Cl. 414-180.000.
Olsson, Billy E., to AMP Incorporated. Interposer connector for surface mounting a ceramic chip carrier to a printed circuit board. 4,558,397, Cl. 361-404.000.
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Yamaguchi, Tathuya, 4,557,254, Cl. 128-4.000.
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Kawai, Kiyoji; and Omori, Tadashi, 4,558,298, Cl. 340-19.00R.
Ona, Isao; Ozaki, Masaru; and Usui, Katsutoshi, to Toray Silicone Company, Ltd. Method for producing thin silicone elastomeric films. 4,557,887, Cl. 264-216.000.
Onda, Kazuyoshi, to Pioneer Electronic Corporation. Cable network monitoring system for CATV system. 4,558,358, Cl. 358-86.000.
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Hamane, Masumi; and Onda, Takanori, 4,557,345, Cl. 180-229.000.
O'Neill, Paul J. Pneumatic tube conveyor. 4,557,638, Cl. 406-186.000.
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Asada, Takafumi; Onishi, Toshio; Senma, Kajuyoshi; and Matsumoto, Hideo, 4,557,610, Cl. 384-107.000.
Onitsuka, Hatsuki; Saito, Shin; and Fukuda, Hideo, to Asahi Kasei Kogyo Kabushiki Kaisha. Packed column having pressure-absorbing mechanism. 4,557,830, Cl. 210-198.200.
Ono, Kaoru: *See*—
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Ono, Kimizo; and Tsuno, Koichi, to Sumitomo Electric Industries, Ltd. Apparatus for checking the internal surface of a pipe or the like. 4,557,598, Cl. 356-241.000.
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Morita, Yukichi; Ono, Koji; Ogata, Eiji; and Manabe, Osamu, 4,558,161, Cl. 568-34.000.
Onodera, Tamio: *See*—
Sumitani, Koji; Sakai, Tokuji; Yamasaki, Yasuo; and Onodera, Tamio, 4,557,919, Cl. 423-329.000.
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Opresko, Stephen T., to RCA Corporation. Cathode-ray tube having an improved low power cathode assembly. 4,558,254, Cl. 313-446.000.
Orain, Michel A., to Glaenzer Spicer. Sealing device including a bellows, in particular for a transmission joint. 4,557,491, Cl. 277-212.0FB.
Orii, Ken; and Kawakami, Takao, to Yamato Scientific Co., Ltd. Clean bench. 4,557,184, Cl. 98-115.300.
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Bencz, Gyozo ; Deres, Janos; and Tuti, Peter, 4,557,771, Cl. 149-14.000.
Palfi, Zoltan; and Krekacs, Sandor, 4,557,875, Cl. 261-75.000.
Osaka University: *See*—
Mori, Hirotaro; and Fujita, Hiroshi, 4,557,765, Cl. 148-4.000.
Osterloh, Rolf: *See*—
Schupp, Eberhard; Loch, Werner; Osterloh, Rolf; and Ahlers, Klaas, 4,557,814, Cl. 204-181.700.
Ota, Kenji: *See*—
Hammock, Bruce D.; and Ota, Kenji, 4,558,004, Cl. 435-4.000.
Ota, Naoto: *See*—
Ishida, Hiroshi; Fujioka, Yoshiki; and Ota, Naoto, 4,558,269, Cl. 318-811.000.
Ota, Tomomi: *See*—
Hatayama, Katsuo; Yoshikawa, Kensei; Sano, Tatsuhiko; Ohuchi, Yutaka; Ota, Tomomi; Sekiuchi, Kazuto; and Sota, Kaoru, 4,557,871, Cl. 556-183.000.
Otsuka Kagaku Yakuhin Kabushiki Kaisha: *See*—
Imai, Tetsuya; Toyohara, Kenichi; Goto, Takeshi; Murata, Tadateru; Ando, Akihide; Uchida, Toshiro; and Yamamoto, Izuru, 4,557,750, Cl. 71-87.000.
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Kawabata, Yoshimasa; and Otsuki, Susumu, 4,558,396, Cl. 361-399.000.
Ottaviano, Gary W., to Ranpak Corp. Mechanism for producing padlike cushioning dunnage from sheet material. 4,557,716, Cl. 493-464.000.
Ouellette, Joseph F. Top feeding and ejecting materials handling apparatus. 4,557,636, Cl. 414-43.000.
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DuBois, Chester G., 4,557,224, Cl. 123-41.150.
Woodard, Robert W., 4,557,227, Cl. 123-65.0PE.
Overmyer, Stephen R., to Francesville Drain Tile Corporation. Corrugated tube coupling. 4,557,510, Cl. 285-305.000.
Owen, David A. A.: *See*—
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Owens, Robert H.: *See*—
Fischer, Robert L.; Pulcrano, Frank C.; Coldiron, Lee C.; Topping, Terry M.; Potter, J. H.; and Owens, Robert H., 4,557,661, Cl. 414-730.000.
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Heyne, John A.; and Chamness, Leland D., 4,557,725, Cl. 604-67.000.
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Oyama, George C. Plant pot with moisturizing and aeration means. 4,557,070, Cl. 47-80.000.
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Ozawa, Toru; and Kinoshita, Hiroshi, to Hitachi, Ltd. Drum type laundry dryer. 4,557,058, Cl. 34-82.000.
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Palfi, Zoltan; and Krekacs, Sandor, to Orszagos Koolaj es Gazipari Troszt. Phase-contacting plate for a phase-contacting column. 4,557,875, Cl. 261-75.000.
Pall Corporation: *See*—
Mason, Robert, 4,557,834, Cl. 210-445.000.
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Vidoz, Aldo E.; Crooks, Donald D.; Lewis, Richard E.; Palmer, Ian G.; and Wadsworth, Jeffrey, 4,557,770, Cl. 148-437.000.
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Laveyne, Michel; and Palvadeau, Claude, 4,557,908, Cl. 423-164.000.
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Para-Flite, Inc.: *See*—
Puskas, Elek, 4,557,439, Cl. 244-63.000.
Paradyne Corporation: *See*—
Armstrong, Thomas R., 4,558,317, Cl. 340-825.060.
Parsons, Basil I.: *See*—
Ternan, Marten; and Parsons, Basil I., 4,558,031, Cl. 502-355.000.
Pasch, Manfred: *See*—
Klose, Sigmar; Pasch, Manfred; Kleemann, Wolfgang; Vieth, Friedhelm; and Buschek, Herbert, 4,557,600, Cl. 356-246.000.
Pasek, Eugene A.: *See*—
Lopez, Jaime; McKinney, Joel D.; and Pasek, Eugene A., 4,557,821, Cl. 208-108.000.

Paspek, Stephen C., Jr.; and Coker, Curtis D., to Standard Oil Company, The. Conversion of high boiling organic materials to low boiling materials. 4,557,820, Cl. 208-8.0LE.

Passarotti, Carlo: *See—*
Doria, Gianfederico; Passarotti, Carlo; and Corno, Maria L., 4,558,046, Cl. 514-227.000.

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Siegel, Stefan A.; Patterson, David R.; Channin, Donald J.; Sergi, Joseph B., Jr.; and Viola, Jeffrey P., 4,558,465, Cl. 455-609.000.

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Black, Robert A., Jr.; Clark, Rodney L.; Kidder, Kenneth B.; and Patton, Paul B., 4,558,389, Cl. 361-88.000.

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Callaghan, Ian C.; Fink, Hans-Ferdi; Gould, Clive M.; Koerner, Gotz; Patzke, Hans-Jurgen; and Weitemeyer, Christian, 4,557,737, Cl. 55-87.000.

Paukovits, Edward J., Jr.: *See—*
Crowman, Stanley W. T.; Dornes, Bryan J.; Paukovits, Edward J., Jr.; Spong, Richard V.; and Talarico, Robert J., 4,557,044, Cl. 29-741.000.

Paul Hellerman GmbH: *See—*
Six, Jorg; and Kobarg, Gerd, 4,557,023, Cl. 24-16.0PB.

Paul Wurth S.A.: *See—*
Mailliet, Pierre; Ulveling, Leon; and Metz, Jean, 4,557,468, Cl. 266-273.000.

Paulson, James C.: *See—*
Irie, Reiko F.; Tai, Tadashi; Morton, Donald L.; Cahan, Leslie D.; and Paulson, James C., 4,557,931, Cl. 424-88.000.

Paurat, Boland: *See—*
Paurat, Friedrich W.; and Paurat, Boland, 4,557,373, Cl. 198-819.000.

Paurat, Friedrich W.; and Paurat, Boland. System for conveying bulk material and people in a mine. 4,557,373, Cl. 198-819.000.

Pauwels, Michael A.; and Wright, Danny O., to Allied Corporation. Method for maintaining the integrity of a dual microprocessor multiprocessing computing system. 4,558,416, Cl. 364-431.110.

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Yagi, Toshiharu; and Pavlath, Attila E., 4,557,945, Cl. 427-40.000.

Pavlovych, Orest: *See—*
Donnelly, Thomas L.; and Pavlovych, Orest, 4,557,584, Cl. 355-3.0DD.

Pazzini, Norbert, to Societe Medi 2000 S.A.R.L. Medical bed. 4,557,471, Cl. 269-325.000.

Pchelkin, Nicholas R.: *See—*
McDermott, William E.; Ellis, David E.; Pchelkin, Nicholas R.; Miller, George W.; Benard, David J.; and Richardson, Ralph J., 4,558,451, Cl. 372-89.000.

Peabody Development Company: *See—*
Smith, Jimmy B.; and Liggett, Julian M., 4,557,733, Cl. 44-10.00C.

Peake, Steven L., to American Cyanamid Company. Process for preparing 9,10-anthracenedicarboxaldehyde. 4,558,163, Cl. 568-436.000.

Pecak, Tadeusz, to NCR Canada Ltd. - NCR Canada LTEE. Sheet decelerating and stopping apparatus. 4,557,473, Cl. 271-229.000.

Pedrazza, Donatus, to Contraves AG. Apparatus for the contactless transmission of data or the like between two relatively rotating parts. 4,558,320, Cl. 340-870.300.

Peeters, Hermann; and Vogt, Wilhelm, to Dynamit Nobel AG. Method of preparing uracil. 4,558,126, Cl. 544-309.000.

Pegrassi, Lorenzo: *See—*
Bernardi, Luigi; Lazzari, Ettore; Malnati, Maria L.; Mazzini, Giuseppe; Pegrassi, Lorenzo; and Rossi, Alessandro, 4,558,049, Cl. 514-234.000.

Peitz, Bernard: *See—*
Joppig, Peter; Peitz, Bernard; and Woschee, Dieter, 4,557,233, Cl. 123-323.000.

Pelam, Inc.: *See—*
McCormick, James B., 4,557,903, Cl. 422-101.000.

Pelletier, Robert: *See—*
Brun, Claude; Cheux, Auguste; and Pelletier, Robert, 4,558,023, Cl. 502-108.000.

Pendleton, Woodrow W.: *See—*
Romine, Gary L.; Pendleton, Woodrow W.; and Dillinger, Daniel D., 4,557,684, Cl. 425-383.000.

Pennebaker, William B.: *See—*
Mitchell, Joan L.; and Pennebaker, William B., 4,558,370, Cl. 358-260.000.

Pennwalt Corporation: *See—*
Georgiev, Vassil S.; and Kinsolving, Clyde R., 4,557,865, Cl. 260-239.30T.
Tubbs, Paul; and King, James, 4,557,839, Cl. 252-23.000.

Penny, Charles, to McMenamy, Bernard M. Compacting apparatus. 4,557,632, Cl. 405-267.000.

Pentel Kabushiki Kaisha: *See—*
Iwata, Masahiro; Miyashita, Yushi; and Taka, Yuichi, 4,557,618, Cl. 401-34.000.

Penzo, Alessandro: *See—*
Ciordinik, Jacques; and Penzo, Alessandro, 4,558,308, Cl. 340-550.000.

Percic, Milan; Schoonderbeek, Hubertus J.; and Alston, Julia M., to Coulter Stork Patents B.V. Apparatus for transferring a toner image from a photoconductive coating to a print sheet. 4,557,583, Cl. 355-3.0TR.

Perdijon, Jean, to Compagnie Generale des Matieres Nucleaires. Ultrasonic echography process and device. 4,557,145, Cl. 73-621.000.

Peressini, Eugene R.: *See—*
Wakalopulos, George; Hill, Robert A.; and Peressini, Eugene R., 4,558,450, Cl. 372-87.000.

Perlegos, George, to Seeq Technology, Inc. Electrically-programmable and electrically-erasable MOS memory device. 4,558,344, Cl. 357-59.000.

Perrins, Allen R.: *See—*
Borowy, Dennis M.; Crotty, Charles A.; Perrins, Allen R.; and Senak, Peter, Jr., 4,558,275, Cl. 324-103.00P.

Perry, Steven B.; and Miller, Joseph, to Keptel, Inc. Remotely-activated switching apparatus. 4,558,182, Cl. 179-81.00R.

Pertec Peripherals Corporation: *See—*
Porter, Carl D., 4,558,380, Cl. 360-53.000.

Petersen, Don W., to Goodyear Aerospace Corporation. Brake disk and keylot reinforcements therefor. 4,557,356, Cl. 188-218.0XL.

Petersen, Hans C.; Kyster, Erik; and Thomsen, Svend E., to Danfoss A/S. Hydrostatic control device, particularly steering device. 4,557,676, Cl. 418-61.00B.

Peterson, Francis C., to Illinois Tool Works, Inc. Clinch nut and assembly machine. 4,557,651, Cl. 411-181.000.

Peterson, John R.: *See—*
Bronson, Stanley O.; Peterson, John R.; and Schumacher, Edward B., 4,558,016, Cl. 501-95.000.

Peterson, Soren E. Agricultural roll for conveying and sorting machines. 4,557,388, Cl. 209-671.000.

Petersson, Bengt. Device for indicating the current score when participating in sport. 4,557,215, Cl. 116-222.000.

Petrak, Daniel R.; Winkelbauer, Howard M.; Kleeb, Thomas R.; and Wang, Ke-Chin, to Dresser Industries, Inc. Refractory. 4,557,884, Cl. 264-65.000.

Petrak, Harry A., to Tenneco Inc. Synchronized clutch assembly with selective override for four-wheel drive vehicles. 4,557,358, Cl. 192-35.000.

Pez, Guido P.: *See—*
Marsella, John A.; and Pez, Guido P., 4,558,157, Cl. 564-132.000.

Pfeiffer, Ralph R.: *See—*
Rolski, Stanislaw; and Pfeiffer, Ralph R., 4,558,053, Cl. 514-283.000.

Pfizer Inc.: *See—*
Bass, Robert J., 4,558,048, Cl. 514-232.000.

Pfundt, William N., to General Machine Products Company, Inc. Tool for mounting connectors to multi-conductor cords or wires. 4,557,034, Cl. 29-566.400.

Phillips Petroleum Company: *See—*
Jack, Douglas S.; and Sarrett, Homer J., Jr., deceased, 4,557,840, Cl. 252-33.200.
Jain, Gyan P., 4,558,423, Cl. 364-501.000.
Johnson, Marvin M., 4,558,138, Cl. 549-87.000.
Johnson, Marvin M.; and Nowack, Gerhard P., 4,558,165, Cl. 568-698.000.
Kukes, Simon G.; Hogan, Robert J.; and Coombs, Daniel M., 4,557,823, Cl. 208-216.00R.
Kukes, Simon G.; and Hawley, Gil R., 4,557,824, Cl. 208-251.00H.
LaSpisa, Ronald J., 4,557,686, Cl. 431-5.000.
Stengle, Nancy K.; and Hobbs, James W., 4,557,806, Cl. 203-1.000.

Philpott, Frank, to Goodyear Tire & Rubber Company, The. Pneumatic tire. 4,557,307, Cl. 152-539.000.

Phlipp, Wilfried. Pad-type printing machine and plate inking assembly therefor. 4,557,195, Cl. 101-163.000.

Phonetics, Inc.: *See—*
Blanchard, Kenneth E.; and Sanislo, Stephen V., Jr., 4,558,181, Cl. 179-5.00P.

Photopoly Ohka Co., Ltd.: *See—*
Aoyama, Toshimi; Tohda, Hiroyuki; Kato, Kazuo; and Nakane, Hisashi, 4,557,996, Cl. 430-324.000.

Piana, Angelo J. Waterproof shower module with tile-ready inner surfaces. 4,557,004, Cl. 4-613.000.

Picard, Jean-Claude M.: *See—*
Denison, Early B.; and Picard, Jean-Claude M., 4,557,332, Cl. 166-345.000.

Pichon, Michel A. Service elevator for construction. 4,557,353, Cl. 187-2.000.

Picker International, Limited: *See—*
Young, Ian R., 4,558,278, Cl. 324-309.000.

Pickering, William, to Towmotor Corporation. Power steering control apparatus and method. 4,557,343, Cl. 180-142.000.

Pickert, Detlef: *See—*
Neumann, Joachim; Pickert, Detlef; and Emmenthal, Klaus-Dieter, 4,557,874, Cl. 261-19.000.

Pierrat, Lambert: *See—*
Delassus, Jean; and Pierrat, Lambert, 4,557,667, Cl. 417-50.000.

Pietrelli, Giuseppe. Motor vehicle body repair bench. 4,557,127, Cl. 72-34.000.

Pike, Myron T.: *See—*
Clark, Henry B., III; and Pike, Myron T., 4,557,837, Cl. 252-8.55C.

Pike, Reginald A., to Union Carbide Corporation. Method for preparing air for separation by rectification. 4,557,735, Cl. 55-26.000.

Pilgram, Kurt H.; and Skiles, Richard D., to Shell Oil Company. Miticidal (2-alkyl-3,4-dihydro-2H-1-benzopyran-8-yl)-diazenecarboxylic acid esters. 4,558,040, Cl. 514-150.000.

Pines of America, Inc.: *See—*
Harris, Timothy S.; and Harrod, Lawrence R., 4,558,263, Cl. 318-139.000.

Pink, John J.; Prunty, Jeffrey L.; and Alba, Donald, to Amana Refrigeration, Inc. Crisper humidity control. 4,557,118, Cl. 62-382.000.

Pioneer Electronic Corporation: *See—*
Aizawa, Koki; Takizawa, Yoshiyuki; Haeno, Akira; and Motoyama, Akira, 4,558,213, Cl. 250-214.00R.
Nakayama, Kazuaki, 4,558,288, Cl. 330-268.000.
Onda, Kazuyoshi, 4,558,358, Cl. 358-86.000.
Tabata, Toshio, 4,558,457, Cl. 377-107.000.
Pioneer Screw & Nut Co.: *See—*
Schaumburg, Theodore R., 4,557,125, Cl. 72-12.000.
Pirtle, James D.: *See—*
Black, Donald E.; Sweany, Louis P.; and Pirtle, James D., 4,558,305, Cl. 340-384.00E.
Pirzer, Carl: *See—*
Jorsa, Norbert, 4,557,301, Cl. 141-5.000.
Pistorius, Rudolf, to Hoechst Aktiengesellschaft. Process for isolating paraffinsulfonates and sulfuric acid of low alkali metal sulfate content from parafinsulfoxidation reaction mixtures. 4,557,873, Cl. 260-513.00R.
Pitt, John M.: *See—*
Rohde, John R.; and Pitt, John M., 4,557,147, Cl. 73-784.000.
Pittet, Alan O.; Muralidhara, Ranya; and Vock, Manfred H., to International Flavors & Fragrances Inc. Flavoring with mercapto-C_2–C_3-alkanoic acid esters. 4,557,941, Cl. 426-535.000.
PKA Pyrolyse Kraftanlagen GmbH: *See—*
Faehnle, Erich, 4,557,204, Cl. 110-346.000.
Plasencia, Armand J.; Tusso, Robert J.; and Gilson, Alan P., to Skantek Corporation. Automatic data capture system with special document handling prior to normal scanning. 4,558,373, Cl. 358-285.000.
Plastics Engineering Company: *See—*
Lee, Chung J., 4,558,085, Cl. 524-299.000.
Plessers, Jacques J.; and Theuwis, Alfons L., to Electro-Nite Co. Sampling device for molten metals. 4,557,152, Cl. 73-864.550.
Plewinsky, Bodo: *See—*
Kamps, Rainer; Plewinsky, Bodo; Miehe, Manfred; and Wetz, Klaus, 4,557,718, Cl. 494-37.000.
Plimley, Raymond E.: *See—*
Goodridge, Francis; Plimley, Raymond E.; and Wright, Allen R., 4,557,812, Cl. 204-130.000.
Plueddemann, Edwin P., to Dow Corning Corporation. Detergent compositions containing insoluble particulates with a cationic surface treatment. 4,557,854, Cl. 252-174.150.
Plummer, Mark A., to Marathon Oil Company. Cracking process catalyst selection based on cation electronegativity. 4,557,803, Cl. 208-108.000.
Poirier, Roger; and Hamill, Donald F., to Pratt & Whitney Canada Inc. Method for diagnosing faults in electronic fuel control systems. 4,557,141, Cl. 73-117.200.
Polaroid Corporation: *See—*
Johnson, Bruce K.; and Whiteside, George D., 4,557,573, Cl. 354-234.100.
Thigpen, Lawrence E., 4,557,742, Cl. 65-2.000.
Pollack, Joel M.: *See—*
Genovese, Frank C.; and Pollack, Joel M., 4,558,255, Cl. 313-497.000.
Pollin, Irvin. Launch setback simulator. 4,557,143, Cl. 73-167.000.
Pollution Control Products Co.: *See—*
Mainord, Kenneth R., 4,557,203, Cl. 110-344.000.
Poock, Darwin N.; and Rathe, Robert A., to FMC Corporation. Method of controlling the angle of a pivotal boom with extensible sections. 4,557,391, Cl. 212-270.000.
Poole, Douglas P., to Marconi Avionics Limited. Power inductive couplers. 4,558,271, Cl. 323-306.000.
Porter, Carl D., to Pertec Peripherals Corporation. Digital tape transport for selectively recording in either a parallel or serial mode. 4,558,380, Cl. 360-53.000.
Porter, Samuel, Jr.: *See—*
Suss, Naomi R.; and Porter, Samuel, Jr., 4,558,075, Cl. 523-216.000.
Poscente, Sandro: *See—*
Trofimenkoff, Frederick N.; Bhagwan, Jai; and Poscente, Sandro P., 4,558,301, Cl. 340-347.0AD.
Poscente, Sandro P.: *See—*
Trofimenkoff, Frederick N.; Bhagwan, Jai; and Poscente, Sandro P., 4,558,301, Cl. 340-347.0AD.
Post, Arthur J., Jr.: *See—*
Baumgartner, Gary J.; Walter, Carl E.; and Post, Arthur J., Jr., 4,557,804, Cl. 202-227.000.
Post, Hans; Ratzel, Dieter; and Brunner, Peter, to Bruker Medizintechnik GmbH. Method for measuring the nuclear magnetic resonance. 4,558,277, Cl. 324-309.000.
Poth, Ulrich: *See—*
Drexler, Hermann-Josef; Ebner, Franz; Hille, Hans-Dieter; and Poth, Ulrich, 4,558,090, Cl. 524-591.000.
Potter, J. H.: *See—*
Fischer, Robert L.; Pulcrano, Frank C.; Coldiron, Lee C.; Topping, Terry M.; Potter, J. H.; and Owens, Robert H., 4,557,661, Cl. 414-730.000.
Povio, Raymond A.: *See—*
Ward, Joseph W.; Povio, Raymond A.; Schroeder, Russell G.; and Chan, Patrick S., 4,558,391, Cl. 361-155.000.
Powell, John M.: *See—*
Jones, Richard C.; and Powell, John M., 4,558,438, Cl. 367-71.000.
Powermatic - Houdaille, Inc.: *See—*
Gardner, Gary L.; and Greathouse, Chester K., 4,557,303, Cl. 144-145.00A.
Powers, John A.; and Christini, James N., to GTE Products Corporation. Method for producing ammonium metatungstate from ammonium paratungstate. 4,557,923, Cl. 423-593.000.
PPG Industries, Inc.: *See—*
Chabal, Joseph; and Bartrug, Bruce A., 4,557,776, Cl. 156-103.000.
Suss, Naomi R.; and Porter, Samuel, Jr., 4,558,075, Cl. 523-216.000.
Pratt, Allyn R.: *See—*
Kinley, Karl S.; and Pratt, Allyn R., 4,557,327, Cl. 166-241.000.
Pratt, Charles E., to Joseph Ayers, Inc. Aluminum soap greases. 4,557,842, Cl. 252-37.700.
Pratt & Whitney Canada Inc.: *See—*
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Pressure Pak, Inc.: *See—*
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Preston, Joseph R.; and Hillenbrand, Louis J., to Battelle Development Corporation. Static free molded plastic parts. 4,557,807, Cl. 204-4.000.
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Laveyne, Michel; and Palvadeau, Claude, 4,557,908, Cl. 423-164.000.
Price, Anthony G., to Lucas Industries public limited company. Master cylinder assembly for a vehicle braking system. 4,557,110, Cl. 60-581.000.
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Mason, James W., 4,557,978, Cl. 428-457.000.
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Pritchard, Dalton H.; and Sepp, Walter E., to RCA Corporation. Progressive scan television system employing vertical detail enhancement. 4,558,347, Cl. 358-11.000.
Probst, Karl; and Hufken, Kurt, to Lindemann Maschinenfabrik GmbH. Paper disintegrator and method of operating same. 4,557,421, Cl. 241-73.000.
Probst, Robert L.; and Groves, William A., to Sybron Corporation. Self activating amalgam capsule. 4,557,376, Cl. 206-219.000.
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Propst, Larry D.: *See—*
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Puskas, Elek, to Para-Flite, Inc. Inflatable airfoil canopy launching method and apparatus. 4,557,439, Cl. 244-63.000.
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Quis, Peter; Siol, Werner; Buechse, Joachim; and Rauch, Hubert, to Rohm GmbH. Plastisol comprising a copolymer of methyl methacrylate and itaconic or its anhydride. 4,558,084, Cl. 524-294.000.
Rabe, Robert L.; and Swan, Paul J., to Honeywell Inc. Logic families interface circuit and having a CMOS latch for controlling hysteresis. 4,558,237, Cl. 307-475.000.
Rabotski, John, to Design Engineering Service, Inc. Method for manufacturing foam boards. 4,557,881, Cl. 264-40.400.
Radermacher, Herbert: *See—*
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Rajagopal, Ganesh, to Mead Corporation, The. Belt system with alignment apparatus. 4,557,372, Cl. 198-807.000.

Rallapalli, Krishna; and Kaku, Shinkyo, to Advanced Micro Devices, Inc. Method and device for two-dimensional facsimile coding. 4,558,371, Cl. 358-261.000.
Ramp, Floyd L.; and Stiberth, Lothar F., to B. F. Goodrich Company, The. Method for suppressing zinc stearate aging bloom. 4,558,086, Cl. 524-399.000.
Randin, Jean-Claude, to Les Fils d'Auguste Maillefer Societe Anonyme A. Ballaigues. Accessory for use in dentistry. 4,557,690, Cl. 433-49.000.
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Ray, James M.; and McConnell, Thomas M., to Ray-McConnell, Inc. Proximal tibial cuff. 4,557,258, Cl. 128-87.00R.
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Angle, Rodney L., 4,558,339, Cl. 357-23.500.
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Kiess, Helmut G.; Binggeli, Bruno K.; and Derendinger, Max, 4,557,886, Cl. 264-105.000.
McGinn, Joseph T.; Jastrzebski, Lubomir L.; and Corboy, John F., Jr., 4,557,794, Cl. 156-612.000.
Miller, Louis D., 4,558,251, Cl. 313-365.000.
Muterspaugh, Max W., 4,558,289, Cl. 330-278.000.
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Stewart, Roger G., 4,558,240, Cl. 307-530.000.
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Redick, Richard W., Jr. Adapter for bottled water dispenser. 4,557,399, Cl. 222-83.500.
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Woolley, Warren H.; Lama, William L.; Rees, James D.; and Durbin, John A., 4,557,581, Cl. 355-1.000.
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Buckley, Bruce S.; Buckley, Edward M.; and Reichwein, Roy H., 4,557,386, Cl. 209-556.000.
Reifschneider, Walter; and Larson, Larry L., to Dow Chemical Company, The. Phosphorus derivatives of 2-fluoroalkyl-5-pyrimidinols useful as insecticides. 4,558,039, Cl. 514-86.000.
Reilly, Kenneth T.: *See*—
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Reinecke, Paul: *See*—
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Reinecke, Rolf; Rinno, Helmut; and Schultz, Gerhart, to Hoechst Aktiengesellschaft. Aqueous dispersion of sulfo-containing polymers for cement additive applications. 4,558,092, Cl. 524-817.000.
Reinicke, Robert H., to Consolidated Controls Corporation. Precision medication dispensing system and method. 4,557,726, Cl. 604-67.000.
Reining, Kuno. Protective covering. 4,557,311, Cl. 160-330.000.
Reishus, Terry, to Storage Technology Corporation. Magnetic tape tension sensor. 4,557,435, Cl. 242-190.000.
Renth, Ernst-Otto: *See*—
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Repco Engineering (NZ) Limited: *See*—
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Sealfon, Andrew; and Yurdin, Carl, 4,557,728, Cl. 604-134.000.
Rexa Corporation: *See*—
Glomeau, J. Robert, 4,557,180, Cl. 91-446.000.
Reyes, Pedro M., Jr. Pelvic support for medical procedures. 4,557,260, Cl. 128-134.000.
Reynolds, Gordon S.; Todd, Robert J.; and Russell, Edward J., to Abbott Laboratories. Disposable transducer apparatus for an electromanometry system. 4,557,269, Cl. 128-675.000.
Reynolds, Richard W., to Sundstrand Corporation. Hydraulic differential transmission. 4,557,160, Cl. 74-687.000.
Rheinmetall GmbH: *See*—
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Rice, Paul D.; and Sharp, Jeffrey O., to Square D Company. Vent assembly for electrical enclosure. 4,557,095, Cl. 52-473.000.
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Blanc, Ernst, 4,557,554, Cl. 350-96.200.
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Richardson, Michael M.; and Schaffer, Douglas A., to Kroy, Inc. Tape supply cartridge. 4,557,617, Cl. 400-208.000.
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McDermott, William E.; Ellis, David E.; Pchelkin, Nicholas R.; Miller, George W.; Benard, David J.; and Richardson, Ralph J., 4,558,451, Cl. 372-89.000.
Richardson-Vicks, Inc.: *See*—
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Riege, David H.: *See*—
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Riegel, Herbert; Huang, Chiung-Yuan; and Strangio, Vincent A., to Lummus Company, The. Hydrogen chloride-propylene separation. 4,558,167, Cl. 570-238.000.
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Riom Laboratories - Cerm S.A.: *See*—
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Rissmann, Edwin F.; and Randolph, Kendall B., to Versar Inc. Process for making fuming nitric acid. 4,557,920, Cl. 423-393.000.
Rittmeister, Hubert; and Seroka, Karl-Heinz, to Nixdorf Computer A.G. Door arrangement for the control panel of an apparatus. 4,557,072, Cl. 49-27.000.
Rivin, Evgeny I. Elastomeric spider coupling. 4,557,703, Cl. 464-73.000.
Road Renovators, Inc.: *See*—
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Robert Bosch GmbH: *See*—
Berger, Gunther; and Frech, Alfred, 4,557,305, Cl. 144-230.000.
Heitmann, Jurgen, 4,558,376, Cl. 360-10.100.
Laufer, Helmut, 4,557,287, Cl. 137-115.000.
Leiber, Heinz, 4,557,528, Cl. 303-92.000.
Stumpe, Werner, 4,557,527, Cl. 303-15.000.
Roberts, George E.; and Waddington, Robert L., to 501 Evelyn Investments Ltd. Clamp for hose, tubing, or the like. 4,557,024, Cl. 24-20.0TT.
Robertson, Wilbert J.: *See*—
Davis, Robert E.; and Robertson, Wilbert J., 4,557,913, Cl. 423-279.000.
Robinson, Daniel T., to Kempsmith Machine Company. Tuck assembly for a pocket file folder line. 4,557,715, Cl. 493-244.000.
Robinson, William M., to Union Camp Corporation. Bag with easy open line of perforations. 4,557,385, Cl. 206-620.000.
Rock, Erich; and Hollenstein, Helmut, to Julius Blum Gesellschaft m.b.H. Pull-out guide assembly for drawers or the like. 4,557,531, Cl. 308-3.800.
Rockwell International Corp.: *See*—
Nichols, Richard A., 4,558,291, Cl. 333-138.000.

Sclar, Nathan, 4,558,342, Cl. 357-30.000.
Western, Ralph E., 4,558,230, Cl. 307-66.000.
Rodgers, Stephen D.; Dick, Richard J.; and McGinnis, Vincent D., to Battelle Development Corporation. Non-emissive, flame-retardant coating compositions. 4,557,870, Cl. 260-404.800.
Rodi, Anton; Blasius, Udo; and Uhrig, Dieter, to Heidelberger Druckmaschinen AG. Safety device for determining improper takeover of sheets by a blanket cylinder. 4,558,216, Cl. 250-223.00R.
Rody, Jean: *See*—
Leppard, David G.; and Rody, Jean, 4,558,131, Cl. 546-222.000.
Rohde, John R.; and Pitt, John M., to Iowa State University Research Foundation, Inc. Bore hole rock shear tester and method for using same. 4,557,147, Cl. 73-784.000.
Rohm GmbH: *See*—
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Rolski, Stanislaw; and Pfeiffer, Ralph R., to Eli Lilly and Company. Naphthalene-1,5-disulfonate salts of dimeric indole-dihydroindole alkaloids. 4,558,053, Cl. 514-283.000.
Romine, Gary L.; Pendleton, Woodrow W.; and Dillinger, Daniel D., to Didde Graphic Systems Corporation. Bender for synthetic resin printing plates. 4,557,684, Cl. 425-383.000.
Ronning, Patricia M.; and Vandesteeg, Gregg A., to Minnesota Mining and Manufacturing Company. Compositions containing surfactant and broadleaf foliar herbicide. 4,557,751, Cl. 71-91.000.
Rood, Allan J.: *See*—
Holden, Chester D.; and Rood, Allan J., 4,557,410, Cl. 227-155.000.
Roos, Hans; Schlaefer, Dieter; Boehn, Hugo; Bittler, Knut; and Kilthau, Heinz, to BASF Aktiengesellschaft. Gas-evolving metal electrode. 4,557,818, Cl. 204-288.000.
Roos, Roland: *See*—
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Root, John A.: *See*—
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Rosen, Perry: *See*—
Coffen, David L.; Holland, George W.; Mandeville, W. Harry; Rosen, Perry; and Wong, Frederick, 4,558,140, Cl. 549-312.000.
Holland, George W.; Rosen, Perry; and Maag, Hans, 4,558,142, Cl. 549-465.000.
Roaler, Richard S.; and Engle, George M., to Advanced Semiconductor Materials America, Inc. Metal-silicide deposition using plasma-enhanced chemical vapor deposition. 4,557,943, Cl. 427-38.000.
Rosseau, Richard B., to FMC Corporation. Debris collection system for street sweepers. 4,557,010, Cl. 15-83.000.
Rossi, Alessandro: *See*—
Bernardi, Luigi; Lazzari, Ettore; Malnati, Maria L.; Mazzini, Giuseppe; Pegrassi, Lorenzo; and Rossi, Alessandro, 4,558,049, Cl. 514-234.000.
Rossmo, William. Leaf cutter bee larvae extracting device. 4,557,005, Cl. 6-12.00R.
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Rotaflex plc: *See*—
Stuart, Robert A., 4,557,547, Cl. 339-184.00R.
Rothmans of Pall Mall Canada Limited: *See*—
Brackmann, Warren A.; and Snaidr, Stanislav M., 4,557,278, Cl. 131-109.100.
Rothwell, Harold L., Jr.; and English, George J., to GTE Products Corporation. Metal halide discharge lamp gas fill process to provide minimal color separation. 4,557,700, Cl. 445-53.000.
Rottler, Donald B. Combination boring and honing apparatus and method. 4,557,640, Cl. 408-27.000.
Rowe, Purnell E.: *See*—
Massey, Richard P.; and Rowe, Purnell E., 4,558,229, Cl. 307-17.000.
Rowland-Hill, E. William: *See*—
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Roychoudhury, Ranajit: *See*—
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Rozenberg, Albina N.: *See*—
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Ruby, Ernest D. Heat control. 4,557,417, Cl. 236-46.00R.
Ruck, Nancy C.; Mills, David R.; and Harting, Erik, to Unisearch Limited. Beam sunlighting device for building interiors. 4,557,565, Cl. 350-262.000.
Rudman, Christopher G., to Amgen. Potentiation of the effects of insulin by peptides. 4,558,033, Cl. 514-4.000.
Rudnev, Jury A.: *See*—
Mizin, Vladimir G.; Zubarev, Alexei G.; Kolganov, Gennady S.; Volkov, Stanislav S.; Rudnev, Jury A.; Ivashina, Evgeny N.; Blinov, Konstantin A.; and Jugov, Petr I., 4,557,758, Cl. 75-51.200.
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Rugheimer, Erich. Connection system for fluid lines having telescoping connecting elements, in particular for respirators or anesthetic units. 4,557,261, Cl. 128-202.270.
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Ruhrgas Aktiengesellschaft: *See*—
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Rumminger, William J. Tandem trailer. 4,557,497, Cl. 280-403.000.
Russ, Norman. Power key turner. 4,557,124, Cl. 70-456.00R.
Russell, Delbert D.; and Yellig, William F., Jr., to Standard Oil Company. Miscible flooding with displacing fluid containing additive compositions. 4,557,330, Cl. 166-274.000.
Russell, Edward J.: *See*—
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Russev, Lyubomir S.: *See*—
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Rutschle, Eugen; Winkler, Hans-Henning; and Haninger, Rudolf, to Chiron-Werke GmbH. Machine tool with tool magazine. 4,557,035, Cl. 29-568.000.
Ryan, Gregory F.: *See*—
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Ryan, Kathryn A.; and Ryan, Gregory F. Baby bottle with handles. 4,557,392, Cl. 215-11.00R.
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Rye, Phillip H. Fish hook and lure. 4,557,065, Cl. 43-43.160.
S. C. Johnson & Son, Inc.: *See*—
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Sabatella, Robert J.: *See*—
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Sabee, Reinhardt N. Method of making form fit diaper with inside seal and thickened crotch. 4,557,777, Cl. 156-201.000.
Sabelstrom, Jan; and Wiholm, Sture, to Dynasonic. Apparatus for folding a sheet of material into a folder. 4,557,714, Cl. 493-442.000.
Sacher, Edward; Wertheimer, Michael R.; and Schreiber, Henry P. Moisture impermeability or organosilicone films. 4,557,946, Cl. 427-41.000.
Saeki, Michio: *See*—
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Sagami Chemical Research Center: *See*—
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Sagawa, Kiyoshi B., to Minnesota Mining and Manufacturing Company. Hardening of poly(vinyl acetal). 4,558,003, Cl. 430-617.000.
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Nygren, B. Hakan; Sandstrom, E. Torbjorn; Stenberg, Johan E.; and Stiblert, Lars B., 4,558,012, Cl. 436-501.000.
Sagues, Paul; and Sagues, Peter, to Mikuni Kogyo Kabushiki Kaisha. Combined housing and heat sink for electronic engine control system components. 4,557,225, Cl. 123-41.310.
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Sagues, Paul; and Sagues, Peter, 4,557,225, Cl. 123-41.310.
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Halberschmidt, Friedrich; Audi, Josef; Radermacher, Herbert; and Schwarzenberg, Norbert, 4,557,745, Cl. 65-104.000.
St. John, Richard C., to I Corp. Belt tensioner system. 4,557,709, Cl. 474-117.000.
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Saito, Tetsuro, to Canon Kabushiki Kaisha. Input element. 4,558,190, Cl. 200-5.00A.
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Baba, Toru; and Saito, Yasuo, 4,557,052, Cl. 30-276.000.
Saitoh, Koichi; Horie, Kiyoshi; Itami, Teruhiko; and Kimoto, Toshifumu, to Fuji Xerox Co., Ltd. Magnetic copying method and apparatus. 4,558,327, Cl. 346-74.200.
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Sumitani, Koji; Sakai, Tokuji; Yamasaki, Yasuo; and Onodera, Tamio, 4,557,919, Cl. 423-329.000.
Sakakibara, Shigemi, to Toyota Jidosha Kabushiki Kaisha. Attachment of sealing boot in disc brake assembly. 4,557,354, Cl. 188-73.450.
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Sakamaki, Hisashi: *See*—
Komiya, Yutaka; Murakami, Katsumi; Inuzuka, Tsuneki; and Sakamaki, Hisashi, 4,557,587, Cl. 355-14.00C.
Sakamoto, Tuneaki: *See*—
Tanaka, Shuji; Nakamura, Shigehira; Sakamoto, Tuneaki; Hirakata, Yoshiaki; and Yamagata, Tetsuo, 4,558,460, Cl. 381-86.000.
Sakanoue, Akira: *See*—
Tsukuda, Hitoshi; and Sakanoue, Akira, 4,557,974, Cl. 428-407.000.
Sakashita, Tatsuo: *See*—
Kan, Masanori; Okazaki, Takuya; and Sakashita, Tatsuo, 4,558,088, Cl. 524-505.000.

Sakata, Masanori, to Nec Corporation. Insulated gate type field effect transistor having a silicon gate electrode. 4,558,338, Cl. 357-23.900.
Sakata, Tsunetaka: *See*—
Shinohara, Masaru; Ueno, Makoto; and Sakata, Tsunetaka, 4,558,369, Cl. 358-257.000.
Sakurai, Kenjiro: *See*—
Kikuchi, Keisuke; Morikawa, Takitaro; Shimada, Junichi; and Sakurai, Kenjiro, 4,557,566, Cl. 350-413.000.
Sakurai, Takeshi: *See*—
Ishida, Matsuhiko; Asano, Masaru; Goto, Shigeru; and Sakurai, Takeshi, 4,557,369, Cl. 198-333.000.
Sakur[illegible] Diesel Kiki Co., Ltd. Injection timing control dev[illegible]r-type fuel injection pumps. 4,557,240, Cl. 123-502.000.
Sala International AB: *See*—
Dittrich, Vital, 4,557,828, Cl. 209-214.000.
Salomon S.A.: *See*—
Graillat, Gerard; and Mabboux, Michel, 4,557,061, Cl. 36-119.000.
Samejima, Shuji: *See*—
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Samodovitz, Arthur J. Piston and spring powered engine. 4,557,228, Cl. 123-78.00E.
Sand, Rudolf: *See*—
Deimling, Karl; Falk, Roland; Krug, Aribert; Nagel, Peter; and Sand, Rudolf, 4,557,947, Cl. 427-130.000.
Sander, Eugene H.; and Cook, Douglas R., to Sander, Eugene H. Product and process for improving the dispersion of a vegetable gum in water. 4,557,938, Cl. 426-453.000.
Sanders Associates, Inc.: *See*—
Burrows, James L., 4,558,236, Cl. 307-465.000.
Sanderson, John R.: *See*—
Krishnan, Sivaram; and Sanderson, John R., 4,558,162, Cl. 568-48.000.
Sandling, Kjell H., to K. S. Konsult Kjell Sandling. Revolving doors. 4,557,073, Cl. 49-41.000.
Sando Iron Works Co., Ltd.: *See*—
Sando, Yoshikazu; and Ishidoshiro, Hiroshi, 4,557,006, Cl. 8-149.100.
Sando, Yoshikazu; and Ishidoshiro, Hiroshi, to Sando Iron Works Co., Ltd. Method for setting and pretreating a cloth. 4,557,006, Cl. 8-149.100.
Sandoz Ltd.: *See*—
Bennett, Brian; and Clough, Donald K., 4,557,730, Cl. 8-442.000.
Sandstrom, E. Torbjorn: *See*—
Nygren, B. Hakan; Sandstrom, E. Torbjorn; Stenberg, Johan E.; and Stiblert, Lars B., 4,558,012, Cl. 436-501.000.
Sanfilippo, Aurora: *See*—
Foglio, Maurizio; Franceschi, Giovanni; Scarafile, Cosimo; Arcamone, Federico; and Sanfilippo, Aurora, 4,558,042, Cl. 514-192.000.
Sanislo, Stephen V., Jr.: *See*—
Blanchard, Kenneth E.; and Sanislo, Stephen V., Jr., 4,558,181, Cl. 179-5.00P.
Sankyo Company Limited: *See*—
Haneishi, Tatsuo; Okazaki, Takao; Torikata, Akio; Nakajima, Mutsuo; Enokita, Ryuzou; Katayama, Toshiaki; and Iwado, Seigo, 4,557,933, Cl. 424-118.000.
Sano, Shinji: *See*—
Kanematsu, Hiroyuki; Nagae, Akimitsu; and Sano, Shinji, 4,558,419, Cl. 364-474.000.
Sano, Shoichi; and Fufukawa, Yoshimi, to Honda Giken Kogyo Kabushiki Kaisha. Steering device for vehicles. 4,557,493, Cl. 280-91.000.
Sano, Tatsuhiko: *See*—
Hatayama, Katsuo; Yoshikawa, Kensei; Sano, Tatsuhiko; Ohuchi, Yutaka; Ota, Tomomi; Sekiuchi, Kazuto; and Sota, Kaoru, 4,557,871, Cl. 556-183.000.
Sanshin Kogyo Kabushiki Kaisha: *See*—
Nakahama, Ryoji, 4,557,696, Cl. 440-61.000.
Nakase, Ryoichi, 4,557,460, Cl. 248-642.000.
Santen Pharmaceutical Co., Ltd.: *See*—
Iwao, Jun-ichi; Iso, Tadashi; and Oya, Masayuki, 4,558,125, Cl. 544-135.000.
Santrade Ltd.: *See*—
Moren, Rolf R., 4,557,609, Cl. 384-94.000.
Sar-A-Lee, Inc.: *See*—
Schwartz, Charles A.; and Cornwell, Kenyon L., 4,557,103, Cl. 53-111.00R.
Sarrett, Homer J., Jr., deceased: *See*—
Jack, Douglas S.; and Sarrett, Homer J., Jr., deceased, 4,557,840, Cl. 252-33.200.
Sarrett, Vivian, Administratrix: *See*—
Jack, Douglas S.; and Sarrett, Homer J., Jr., deceased, 4,557,840, Cl. 252-33.200.
Sartori, Francesco. Fixture to support adhesive paper rollers on roller brushes for dusting clothing articles. 4,557,011, Cl. 15-104.00A.
Saruhashi, Masakuni: *See*—
Koyama, Mikio; Okaniwa, Kenichiro; Saruhashi, Masakuni; and Ohmachi, Yuko, 4,557,901, Cl. 422-56.000.
Sasaki, Hidetomo: *See*—
Kajiya, Hiroshi; and Sasaki, Hidetomo, 4,557,169, Cl. 83-156.000.
Sasaki, Itsuo; and Matsuo, Kenji, to Tokyo Shibaura Denki Kabushiki Kaisha. Low pass filter. 4,558,292, Cl. 333-173.000.
Sasaki, Shigeru: *See*—
Mori, Hidetomo; Matsushita, Osami; Matsubara, Katsumi; Ida, Michiaki; and Sasaki, Shigeru, 4,557,679, Cl. 418-201.000.
Sasaki, Tadao, to Sony Corporation. Color subcarrier generator. 4,558,349, Cl. 358-16.000.
Sasaki, Tamotsu; and Tsuchiya, Yutaka, to Toshiba Kikai Kabushiki Kaisha. Workpiece transfer apparatus. 4,558,266, Cl. 318-571.000.
Sasakura, Masaaki; and Imada, Kunihiko, to Sumitomo Chemical Company, Limited. Method for dyeing blended fiber materials of cellulose fiber and amide nitrogen-containing fiber with mono- and di-functional reactive dyes. 4,557,731, Cl. 8-531.000.
Sasayama, Takao: *See*—
Yamada, Kazuji; Sato, Hideo; Kitadate, Yukitaka; Kawakami, Kanji; Kato, Kazuo; and Sasayama, Takao, 4,558,238, Cl. 307-491.000.
Sato, Hideo: *See*—
Horie, Seiji; Kawamura, Kouichi; Makino, Naonori; and Sato, Hideo, 4,557,988, Cl. 430-58.000.
Yamada, Kazuji; Sato, Hideo; Kitadate, Yukitaka; Kawakami, Kanji; Kato, Kazuo; and Sasayama, Takao, 4,558,238, Cl. 307-491.000.
Sato, Hisato: *See*—
Takatsu, Haruyoshi; and Sato, Hisato, 4,558,151, Cl. 560-118.000.
Sato, Keiji: *See*—
Kato, Takashi; Yoshikawa, Tomio; Sato, Keiji; and Yoshioka, Kazuo, 4,557,114, Cl. 62-126.000.
Sato, Yasumasa: *See*—
Kishida, Kazuo; Yamamoto, Naoki; and Sato, Yasumasa, 4,558,099, Cl. 525-301.000.
Satoh, Noboru, to NEC Corporation. Memory system for storing analog information. 4,558,431, Cl. 365-45.000.
Sauer, Donald J., to RCA Corporation. Sampled data vertical detail signal processor. 4,558,352, Cl. 358-31.000.
Sauer, Hans, to Varta Batterie Aktiengesellschaft. Air/oxygen cell. 4,557,983, Cl. 429-27.000.
Saunders, Peter R.: *See*—
Lofquist, Robert A.; Twilley, Ian C.; and Saunders, Peter R., 4,558,097, Cl. 525-183.000.
Saunier, Paul; and Shih, Hung-Dah, to Texas Instruments Inc. Multiple high electron mobility transistor structures without inverted heterojunctions. 4,558,337, Cl. 357-22.000.
Savard, Guy; and Lee, Robert G. H., to Canadian Liquid Air Ltd./Air Liquide Canada LTEE. Oil recovery by in-situ combustion. 4,557,329, Cl. 166-261.000.
Savich, Peter P., to Union Carbide Corporation. Bag making machine and method. 4,557,713, Cl. 493-194.000.
Sawada, Tsuguo: *See*—
Kitamori, Takehiko; Fujii, Masaaki; and Sawada, Tsuguo, 4,557,137, Cl. 73-24.000.
Scaduto, Domenico: *See*—
Scaduto, Onofrio; and Scaduto, Domenico, 4,557,502, Cl. 280-756.000.
Scaduto, Onofrio; and Scaduto, Domenico. Roll bar retracting mechanism for convertibles. 4,557,502, Cl. 280-756.000.
Scaglia, Mario, to M. Scaglia S.p.A. Device for supporting and handling loads by means of vacuum operated suction pads. 4,557,659, Cl. 414-627.000.
Scapa-Porritt Limited: *See*—
Eglin, Steven, 4,557,025, Cl. 28-141.000.
Scarafile, Cosimo: *See*—
Foglio, Maurizio; Franceschi, Giovanni; Scarafile, Cosimo; Arcamone, Federico; and Sanfilippo, Aurora, 4,558,042, Cl. 514-192.000.
Scepanovic, Vojislav; and Raiche, Rejean. Portable slotting and grooving attachment. 4,557,644, Cl. 409-143.000.
Schachter, Rozalie; Viscogliosi, Marcello; and Bunz, Lewis A., to Stauffer Chemical Company. Thin film field effect transistors utilizing a polypnictide semiconductor. 4,558,340, Cl. 357-23.700.
Schaefer, Richard M.; and Tome, James J., to Minnesota Mining and Manufacturing Company. Stress-opacifying tamper indicating tape. 4,557,505, Cl. 283-81.000.
Schaefer, Rolf: *See*—
Druschke, Frank; Kraus, Georg; Kuenzel, Ulrich; Ruh, Wolf D.; and Schaefer, Rolf, 4,557,796, Cl. 156-643.000.
Schaffer, Douglas A.: *See*—
Richardson, Michael M.; and Schaffer, Douglas A., 4,557,617, Cl. 400-208.000.
Schaible, Siegfried, to Klockner-Humboldt-Deutz AG Zweigniederlassung Fahr. Apparatus for binding rolled bales of agricultural harvested crops. 4,557,189, Cl. 100-4.000.
Schaller, Klaus: *See*—
Hagenmaier, Hans-Paul; Werner, Gerhard; Drautz, Hannelore; Holst, Hartwig; Zahner, Hans; Brandes, Wilhelm; Reinecke, Paul; Zoebelein, Gerhard; Stendel, Wilhelm; Andrews, Peter; and Schaller, Klaus, 4,558,139, Cl. 549-271.000.
Schatz, Friedrich: *See*—
Wcislo, Manfred; Breitenbach, Otto; Schatz, Friedrich; and Riepling, Ulrich, 4,557,038, Cl. 29-596.000.
Schaudt Maschinenbau GmbH: *See*—
Brill, Jurgen, 4,557,078, Cl. 51-325.000.
Schaumburg, Theodore R., to Pioneer Screw & Nut Co. Apparatus for on line, random sample, inspection of cold-formed blanks for threaded fasteners. 4,557,125, Cl. 72-12.000.
Schelleng, Robert D.: *See*—
Jatkar, Arun D.; Varall, Alfred J., Jr.; and Schelleng, Robert D., 4,557,893, Cl. 419-12.000.
Schering Aktiengesellschaft: *See*—
Wiechert, Rudolf; Bittler, Dieter; Schleusener, Annerose; and Albring, Manfred, 4,558,041, Cl. 514-178.000.

Schickedanz, Willi. Camera. 4,557,572, Cl. 354-219.000.

Schirneker, Hans-Ludwig. Fuel element and fireplace constructions using same. 4,557,687, Cl. 431-291.000.

Schlaefer, Dieter: *See—*
Roos, Hans; Schlaefer, Dieter; Boehn, Hugo; Bittler, Knut; and Kilthau, Heinz, 4,557,818, Cl. 204-288.000.

Schlang, Arthur, to Litton Systems, Inc. Text line bounding system. 4,558,461, Cl. 382-9.000.

Schleusener, Annerose: *See—*
Wiechert, Rudolf; Bittler, Dieter; Schleusener, Annerose; and Albring, Manfred, 4,558,041, Cl. 514-178.000.

Schmelzer Corporation: *See—*
Benjamin, Benjamin C., 4,557,455, Cl. 248-496.000.

Schmid, Walter A.; and Bertschinger, Hans, to Locher & Cie AGZZ. Apparatus and method for tunnel construction with shield drive. 4,557,627, Cl. 405-146.000.

Schmidt, Eric E.; and Lampson, Butler W., to Xerox Corporation. Software version management system. 4,558,413, Cl. 364-300.000.

Schmidt, Paul J.; and Hung, William M., to Hilton-Davis Chemical Co., The. Bis phenyl (2 carboxylic acid or ester indol-3-yl)methanes. 4,558,137, Cl. 548-492.000.

Schmidt, Peter. Bathtub elevator. 4,557,002, Cl. 4-564.000.

Schmidt, Terrence W., to Lockheed Missiles & Space Co., Inc. Form stabilized low water plane area twin hull vessels. 4,557,211, Cl. 114-61.000.

Schmitt, Werner: *See—*
Bronstert, Klaus; Nickl, Johann; Krause, Hans-Joachim; and Schmitt, Werner, 4,558,104, Cl. 526-65.000.

Schneeberger, Rudolf, to Rieter Machine Works, Ltd. Package ejector mechanism. 4,557,424, Cl. 242-41.000.

Schneider, Hartmut; and Lebetzki, Egon, to Siemens Aktiengesellschaft. Doped glass and process for making. 4,557,561, Cl. 350-96.340.

Schneider, Juergen: *See—*
Foell, Helmut; Grabmaier, Josef; and Schneider, Juergen, 4,557,793, Cl. 156-608.000.

Schnell, Leonard R.: *See—*
Grone, Robert J.; Schnell, Leonard R.; and Vearil, Wayne L., 4,557,783, Cl. 156-257.000.

Schober, Robert C., to American Hospital Supply Corporation. Programmable digital cardiac pacer. 4,557,266, Cl. 128-419.0PG.

Schonafinger, Karl; Bohn, Helmut; Just, Melitta; and Martorana, Piero, to Cassella Aktiengesellschaft. Substituted 1,4-dihydropyridines and their use as medicaments. 4,558,058, Cl. 514-342.000.

Schoonderbeek, Hubertus J.: *See—*
Percic, Milan; Schoonderbeek, Hubertus J.; and Alston, Julia M., 4,557,583, Cl. 355-3.0TR.

Schoonover, David J.; and Taylor, Tillman F., Jr., to Hach Company. Water-in-oil testing apparatus. 4,557,899, Cl. 422-55.000.

Schreiber, Henry P.: *See—*
Sacher, Edward; Wertheimer, Michael R.; and Schreiber, Henry P., 4,557,946, Cl. 427-41.000.

Schroeder, George O.: *See—*
Newsome, David L.; Rein, Arnold R.; Hoss, Bradley J.; and Schroeder, George O., 4,557,780, Cl. 156-244.110.

Schroeder, Russell G.: *See—*
Ward, Joseph W.; Povio, Raymond A.; Schroeder, Russell G.; and Chan, Patrick S., 4,558,391, Cl. 361-155.000.

Schromm, Kurt: *See—*
Mentrup, Anton; Schromm, Kurt; Renth, Ernst-Otto; Muacevic, Gojko; and Fugner, Armin, 4,558,061, Cl. 514-392.000.

Schulein, Rolf G.: *See—*
Knebel, Michael; and Schulein, Rolf G., 4,557,012, Cl. 15-116.00R.

Schultz, Gerhart: *See—*
Reinecke, Rolf; Rinno, Helmut; and Schultz, Gerhart, 4,558,092, Cl. 524-817.000.

Schultz, Ronald L.: *See—*
Marks, Arthur D.; and Schultz, Ronald L., 4,557,123, Cl. 70-395.000.

Schulz, Gerald O.; and Gueldenzopf, Thomas D., to S. C. Johnson & Son, Inc. Polymer sheet for delivering laundry care additive and laundry care product formed from same. 4,557,852, Cl. 252-95.000.

Schumacher, Edward B.: *See—*
Bronson, Stanley O.; Peterson, John R.; and Schumacher, Edward B., 4,558,016, Cl. 501-95.000.

Schumann, Martin. Light-responsive musical instrument. 4,557,175, Cl. 84-330.000.

Schupp, Eberhard; Loch, Werner; Osterloh, Rolf; and Ahlers, Klaas, to BASF Aktiengesellschaft. Synthetic resin carrying basic nitrogen groups, and its preparation. 4,557,814, Cl. 204-181.700.

Schutten, Herman P.; Benjamin, James A.; and Lade, Robert W., to Eaton Corporation. Bidirectional power FET with shorting-channel off state. 4,558,243, Cl. 307-584.000.

Schwab, Arthur W.; and Pryde, Everett H., to United States of America as represented by the Secretary of Agriculture, The. Microemulsions from vegetable oil and lower alcohol with octanol surfactant as alternative fuel for diesel engines. 4,557,734, Cl. 44-53.000.

Schwartz, Charles A.; and Cornwell, Kenyon L., to Sar-A-Lee, Inc. Apparatus for squeeze packaging butter-like products. 4,557,103, Cl. 53-111.00R.

Schwartz, William A.: *See—*
Gussow, Stanley; Spence, David C.; and Schwartz, William A., 4,558,168, Cl. 585-324.000.

Schwarzenberg, Norbert: *See—*
Halberschmidt, Friedrich; Audi, Josef; Radermacher, Herbert; and Schwarzenberg, Norbert, 4,557,745, Cl. 65-104.000.

Schwarzmann, Russell A.: *See—*
Lillibridge, Herbert J.; and Schwarzmann, Russell A., 4,557,412, Cl. 228-155.000.

Sclar, Nathan, to Rockwell International Corporation. Thermoelectric infrared detector array. 4,558,342, Cl. 357-30.000.

SCM Corporation: *See—*
Hwang, Jennie S., 4,557,767, Cl. 148-23.000.
Memmer, Timothy I.; and Abel, Peter T., 4,557,977, Cl. 428-421.000.

Scordo, Dominick, to AT&T Bell Laboratories. Programmable audio mixer. 4,558,180, Cl. 179-18.0BC.

Scott, Graham W.; and Steven, James H., to Imperial Chemical Industries PLC. Method of concentrating silka in an aqueous alkali metal silicate solution. 4,557,815, Cl. 204-182.200.

Scott Paper Company: *See—*
Avis, Robert P., 4,557,801, Cl. 162-157.600.

Scott, Paul F.: *See—*
Braithwaite, David; Walker, Richard A.; Bystrianyk, Wasyl; Scott, Paul F.; and Douglas, Robert J., 4,557,746, Cl. 65-163.000.

Scovil Inc.: *See—*
Kuypers, Harold A., 4,557,308, Cl. 152-427.000.

Seafreeze Limited Partnership: *See—*
Van Devanter, Douglas E.; Moore, Kelly R.; and Tomlin, James S., 4,557,019, Cl. 17-52.000.

Sealectro Corporation: *See—*
Dreyer, Charles W., 4,557,546, Cl. 339-177.00R.

Sealey, Harold D.: *See—*
Hardy, Brian E.; and Sealey, Harold D., 4,557,323, Cl. 165-163.000.

Sealfon, Andrew; and Yurdin, Carl, to Repro-Med Systems, Inc. Spring-operated liquid-dispensing device. 4,557,728, Cl. 604-134.000.

Security Engineering, Inc.: *See—*
Charlton, Newton W., 4,557,121, Cl. 70-279.000.

Sedlmeier, Werner: *See—*
Holzner, Peter; and Sedlmeier, Werner, 4,558,410, Cl. 364-200.000.

Seeley, Thomas E. Brick cleaning machine. 4,557,246, Cl. 125-26.000.

Seely, Neil G., to Eastman Kodak Company. Viewfinder for autofocus cameras. 4,557,578, Cl. 354-400.000.

Seeq Technology, Inc.: *See—*
Perlegos, George, 4,558,344, Cl. 357-59.000.

Seid, Bernhard: *See—*
Berbner, Heinz; Seid, Bernhard; Voelker, Heinz; and Zettler, Hans D., 4,557,969, Cl. 428-283.000.

Seidel, Wolfgang; Kazda, Stanislav; and Knorr, Andreas, to Bayer Aktiengesellschaft. Vaso-dilating 1,4-dihydropyridine lactams. 4,558,055, Cl. 514-291.000.

Seidensticker, Jens; and Grosswendt, Werner, to Rheinmetall GmbH. Process for flight-attitude-adjustment of a flying body and/or activation of live load carried by the flying body and arrangement for carrying out the process. 4,557,437, Cl. 244-3.210.

Seifried, Walter: *See—*
Walch, Axel; Seifried, Walter; Michel, Wolfgang; Kuhls, Jurgen; and Wildhardt, Jurgen, 4,557,955, Cl. 428-35.000.

Seiki, Kazuo: *See—*
Morishita, Toshio; Yasui, Yoshiharu; Suzuki, Yoshihisa; Seiki, Kazuo; and Nakamura, Haruyoshi, 4,557,022, Cl. 19-267.000.

Seki, Megumi: *See—*
Takagiwa, Hiroyuki; Takahashi, Jiro; Shirose, Meizo; Inaba, Naomi; and Seki, Megumi, 4,557,991, Cl. 430-109.000.

Sekihara, Kensuke: *See—*
Yamamoto, Etsuji; Sekihara, Kensuke; Kohno, Hideki; and Yamamoto, Shinji, 4,558,425, Cl. 364-555.000.

Sekiuchi, Kazuto: *See—*
Hatayama, Katsuo; Yoshikawa, Kensei; Sano, Tatsuhiko; Ohuchi, Yutaka; Ota, Tomomi; Sekiuchi, Kazuto; and Sota, Kaoru, 4,557,871, Cl. 556-183.000.

Sekiya, Toshiyuki: *See—*
Nagano, Teruo; Nakakita, Eiji; and Sekiya, Toshiyuki, 4,557,994, Cl. 430-162.000.

Semeny, Valery Y.: *See—*
Golik, Georgy A.; Demchenko, Yaroslav P.; Lozinsky, Miron O.; Malovik, Vladlen V.; and Semeny, Valery Y., 4,557,754, Cl. 71-98.000.

Senak, Peter, Jr.: *See—*
Borowy, Dennis M.; Crotty, Charles A.; Perrins, Allen R.; and Senak, Peter, Jr., 4,558,275, Cl. 324-103.00P.

Sengoku, Koji: *See—*
Sugisawa, Ko; Yamamoto, Masanori; Shibuki, Masaru; Nomura, Yukihiro; Sengoku, Koji; Higashine, Seiji; and Hioki, Hiroko, 4,557,939, Cl. 426-473.000.

Senma, Kajuyoshi: *See—*
Asada, Takafumi; Onishi, Toshio; Senma, Kajuyoshi; and Matsumoto, Hideo, 4,557,610, Cl. 384-107.000.

Sepp, Walter E.: *See—*
Pritchard, Dalton H.; and Sepp, Walter E., 4,558,347, Cl. 358-11.000.

Seragnoli, Enzo, to G. D. Societa' per Azioni. Machine for manufacturing continuous cigarette rods simultaneously. 4,557,277, Cl. 131-84.300.

Sergi, Joseph B., Jr.: *See—*
Siegel, Stefan A.; Patterson, David R.; Channin, Donald J.; Sergi, Joseph B., Jr.; and Viola, Jeffrey P., 4,558,465, Cl. 455-609.000.

Serizawa, Moriyoshi; and Hakamada, Haruo, to Konishiroku Photo Industry Co., Ltd. Photographic printing apparatus. 4,557,591, Cl. 355-40.000.

Seroka, Karl-Heinz: *See*—
Rittmeister, Hubert; and Seroka, Karl-Heinz, 4,557,072, Cl. 49-27.000.
Serrano, Pedro, to AMP Incorporated. Insulating sleeve applying apparatus. 4,557,045, Cl. 29-747.000.
Sessler, Gerhard M.: *See*—
Lerch, Reinhard; and Sessler, Gerhard M., 4,558,249, Cl. 310-322.000.
Seton Company: *See*—
Cioca, Gheorghe; Siegler, Marcel; and Spiliadis, Apostol, 4,557,855, Cl. 252-355.000.
Seuser, Ulrich H.: *See*—
Ullmann, Werner; Bantle, Max; Neumann, Harry; Seuser, Ulrich H.; and Mathys, Andre, 4,557,075, Cl. 51-58.000.
Sevald, William T.: *See*—
Vogt, Norman H., 4,557,014, Cl. 17-1.00R.
Shada, Douglas M.: *See*—
Bauer, John F.; and Shada, Douglas M., 4,558,070, Cl. 514-557.000.
Shanklin, James R., Jr.; and Johnson, Christopher P., III, to A. H. Robins Company, Incorporated. N-(Aryloxyalkyl)-N'-(aminoalkyl)-thioureas. 4,558,155, Cl. 564-27.000.
Sharipov, Fyarit A.: *See*—
Kontar, Evgeny A.; Soloviev, Sergei L.; Brovko, Viktor P.; Glukhikh, Rudolf G.; Khomyakov, Evgeny N.; Pakhomov, Jury F.; Khmeljuk, Alexei M.; Vyalykh, Vladimir I.; Zansokhov, Leonid G.; Smertin, Valentin P.; Evseev, Alexei I.; and Sharipov, Fyarit A., 4,557,697, Cl. 441-2.000.
Sharp, Jeffrey O.: *See*—
Rice, Paul D.; and Sharp, Jeffrey O., 4,557,095, Cl. 52-473.000.
Sharp Kabushiki Kaisha: *See*—
Tanaka, Junichi; Furubayashi, Hisatoshi; Watanabe, Masanori; and Hijikigawa, Masaya, 4,558,393, Cl. 361-286.000.
Shaw, Dave H.: *See*—
Arcuri, Kym B.; Mauldin, Charles H.; and Shaw, Dave H., 4,558,030, Cl. 502-325.000.
Shaw, John B. Dishwasher. 4,557,283, Cl. 134-177.000.
Shaw, Wilfrid G.: *See*—
Paparizos, Christos; Shout, Robert S.; and Shaw, Wilfrid G., 4,558,029, Cl. 502-211.000.
Sheehan, Ronald T.: *See*—
Hyman, Myles; Sheehan, Ronald T.; and Rowland-Hill, E. William, 4,557,276, Cl. 130-27.0AE.
Sheesley, Gary, to Empire Abrasive Equipment Corporation. Spin blaster. 4,557,079, Cl. 51-411.000.
Shell Offshore Inc.: *See*—
Denison, Early B.; and Picard, Jean-Claude M., 4,557,332, Cl. 166-345.000.
Shell Oil Company: *See*—
Eckert, Rudolf J. A., 4,557,849, Cl. 252-51.50R.
Pilgram, Kurt H.; and Skiles, Richard D., 4,558,040, Cl. 514-150.000.
Sherman, Benjamin F., Jr.; and Francis, Samuel. Three-dimensional sliding element puzzle. 4,557,484, Cl. 273-153.00S.
Sherman, Michael I.; Elmore, Carl L.; and Brison, Robert J., to Kamyr, Inc. Leaching and washing a flocculated slurry having a fiber content. 4,557,905, Cl. 423-27.000.
Shiba, Haruo; and Iizuka, Michio, to TDK Corporation. Magnetic tape cassette. 4,558,387, Cl. 360-132.000.
Shibata, Akira; and Ohashi, Shinichi, to Hitachi, Ltd.; and Hitachi Video Engineering Inc. Method and apparatus for a magnetic recording/reproducing. 4,558,378, Cl. 360-19.100.
Shibata, Masamichi: *See*—
Kashima, Osamu; and Shibata, Masamichi, 4,557,229, Cl. 123-169.0EL.
Shibata, Ryoichi, to Katushiki Kiisha Kuken. Impact wrench. 4,557,337, Cl. 173-93.500.
Shibuki, Masaru: *See*—
Sugisawa, Ko; Yamamoto, Masanori; Shibuki, Masaru; Nomura, Yukihiro; Sengoku, Koji; Higashine, Seiji; and Hioki, Hiroko, 4,557,939, Cl. 426-473.000.
Shigeta, Masao; and Ojima, Teruhiko, to TDK Corporation. Saturable core consisting of a thin strip of amorphous magnetic alloy and a method for manufacturing the same. 4,558,297, Cl. 336-213.000.
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Saunier, Paul; and Shih, Hung-Dah, 4,558,337, Cl. 357-22.000.
Shiiba, Minoru: *See*—
Kohno, Atsuo; and Shiiba, Minoru, 4,557,574, Cl. 354-288.000.
Shiibayashi, Masao: *See*—
Murayama, Akira; Kuno, Hiroaki; Uchikawa, Naoshi; Tamura, Takahiro; Mizuno, Takao; Kotani, Sumihisa; Tomita, Yoshikatsu; Arata, Tetsuya; Shiibayashi, Masao; and Suefuji, Kazutaka, 4,557,675, Cl. 418-55.000.
Shimada, Junichi: *See*—
Kikuchi, Keisuke; Morikawa, Takitaro; Shimada, Junichi; and Sakurai, Kenjiro, 4,557,566, Cl. 350-413.000.
Shimada, Yutaka; Mukasa, Koichi; Hatanai, Takashi; and Nakashima, Keishi, to Alps Electric Co., Ltd. Soft magnetic material. 4,557,769, Cl. 148-31.550.
Shimizu, Shigeo: *See*—
Koyama, Hiroaki; and Shimizu, Shigeo, 4,558,089, Cl. 524-509.000.
Shimizu, Yasuo, to Honda Giken Kogyo Kabushiki Kaisha. Variable ratio drive. 4,557,705, Cl. 474-13.000.
Shimomura, Yasunori: *See*—
Kamata, Kazumasa; Nakai, Yoshio; and Shimomura, Yasunori, 4,558,098, Cl. 525-207.000.
Shinoda, Nobuhiko, to Canon Kabushiki Kaisha. Auto focus apparatus for a camera. 4,557,577, Cl. 354-400.000.
Shinohara, Masaru; Ueno, Makoto; and Sakata, Tsunetaka, to Iwasaki Tsushinki Kabushiki Kaisha. Facsimile connection system. 4,558,369, Cl. 358-257.000.
Shirahata, Ryuji: *See*—
Yamamoto, Nobuyuki; Yabe, Masao; Nishikawa, Yasuo; Yanai, Akio; Shirahata, Ryuji; and Naruo, Kyoichi, 4,557,948, Cl. 427-131.000.
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Morikawa, Yuichi; Saito, Kazuo; Amada, Eiichi; and Shirasu, Hirotoshi, 4,558,185, Cl. 179-170.0NC.
Shirose, Meizo: *See*—
Takagiwa, Hiroyuki; Takahashi, Jiro; Shirose, Meizo; Inaba, Naomi; and Seki, Megumi, 4,557,991, Cl. 430-109.000.
Shirtum, Robert P.: *See*—
Wernli, Walter L.; and Shirtum, Robert P., 4,558,116, Cl. 528-95.000.
Shiuh, Jerome C.; and Tocci, Mario P., to Manville Service Corporation. Preparation and expansion of perlite ore fines. 4,557,883, Cl. 264-43.000.
Shout, Robert S.: *See*—
Paparizos, Christos; Shout, Robert S.; and Shaw, Wilfrid G., 4,558,029, Cl. 502-211.000.
Showa Denko Kabushiki Kaisha: *See*—
Maeda, Masahiko; Watanabe, Naotochi; and Fujitani, Kenji, 4,557,859, Cl. 252-511.000.
Showalter, Merle R., to Automotive Engine Associates. Combustion roughness servo control to control fuel/air metering or EGR metering to an internal combustion engine. 4,557,236, Cl. 123-435.000.
Shrestha, Mukunda B.; and Mendenhall, Geoffrey N., to Broadcast Electronics, Inc. Impedance-matching device for power amplifier circuit. 4,558,285, Cl. 330-53.000.
Shriver, Ronald D., to Yellowstone, Ltd. Control system for an automatic ladling apparatus. 4,558,421, Cl. 364-477.000.
Shroot, Braham; Maignan, Jean; and Lang, Gerard, to Groupement d'Interet Economique dit: Centre International de Recherches Dermatologiques C.I.R.D. 1,8-Dihydroxy-9-anthrones derivatives substituted in the 10-position by an unsaturated radical used in human medicine. 4,558,069, Cl. 514-473.000.
Shrum, Kenneth L., to Sun Studs, Inc. Block stabilizer for veneer lathe. 4,557,304, Cl. 144-213.000.
Shum, Lanson Y., to Westinghouse Electric Corp. Automated system monitoring using frequency and amplitude modulation. 4,558,319, Cl. 340-870.090.
Shum, Lanson Y.: *See*—
Csakvary, Tibor; Shum, Lanson Y.; and Miller, Bernard, 4,557,663, Cl. 414-751.000.
Shum, Wilfred P.; White, John F.; and Beals, Eva M., to Atlantic Richfield Company. Oxidation of isobutylene oxide to methacrylic acid and methacrolein. 4,558,154, Cl. 562-537.000.
Sibalis, Dan, to Drug Delivery Systems Inc. Applicator for the non-invasive transcutaneous delivery of medicament. 4,557,723, Cl. 604-20.000.
Sibilia, John P.: *See*—
Kotliar, Abraham M.; Sibilia, John P.; Hughes, Ronald H.; and Landy, Richard A., 4,558,019, Cl. 501-101.000.
Siciliano, Stephen J. Dispenser for toilet paper and the like. 4,557,426, Cl. 242-55.300.
Sieg, George F.: *See*—
Smith, James O.; Vetter, Ronald F.; and Sieg, George F., 4,557,197, Cl. 102-202.000.
Siegel, Carole E.: *See*—
Sunshine, Abraham; Laska, Eugene M.; and Siegel, Carole E., 4,558,051, Cl. 514-261.000.
Siegel, Stefan A.; Patterson, David R.; Channin, Donald J.; Sergi, Joseph B., Jr.; and Viola, Jeffrey P., to RCA Corporation. Switched bias scheme for high speed laser transmitter. 4,558,465, Cl. 455-609.000.
Siegler, Marcel: *See*—
Cioca, Gheorghe; Siegler, Marcel; and Spiliadis, Apostol, 4,557,855, Cl. 252-355.000.
Siemens Aktiengesellschaft: *See*—
Foell, Helmut; Grabmaier, Josef; and Schneider, Juergen, 4,557,793, Cl. 156-608.000.
Gfrerer, Manfred, 4,557,805, Cl. 202-270.000.
Holzner, Peter; and Sedlmeier, Werner, 4,558,410, Cl. 364-200.000.
Hutter, Helmut; and Maier, Heinz, 4,558,379, Cl. 360-32.000.
Schneider, Hartmut; and Lebetzki, Egon, 4,557,561, Cl. 350-96.340.
Stoerk, Peter; and Thom, Gunter, 4,557,555, Cl. 350-96.200.
Siepser, Steven B. Artificial intraocular lenses and method for their surgical implantation. 4,556,998, Cl. 623-6.000.
Sievers, Erich, to Kupfer, Manfred. Device for continuous application of foam onto a flat structure. 4,557,218, Cl. 118-612.000.
Siewert, Wolfgang: *See*—
Flucher, Wolfgang; and Siewert, Wolfgang, 4,557,826, Cl. 209-11.000.
Sikdar, Subhas K., to General Electric Company. Two phase interfacial polycondensation polycarbonate process. 4,558,118, Cl. 528-196.000.
Sill, Marvin S. Vehicle lift device for tow trucks. 4,557,496, Cl. 280-402.000.

Silver Seiko Limited: *See*—
Goto, Isamu, 4,557,119, Cl. 66-60.00H.
Silvestri, George J., Jr.; and Davids, Joseph, to Westinghouse Electric Corp. Single low pressure turbine with zoned condenser. 4,557,113, Cl. 60-693.000.
Simco Company, Inc., The: *See*—
Antonevich, John N., 4,558,309, Cl. 340-649.000.
Simjian, Luther G., to Command Automation, Inc. Chair with moving seat and moving mirror. 4,557,520, Cl. 297-185.000.
Simon, Phyllis M.: *See*—
Beals, Penny L.; Simon, Phyllis M.; and Campbell, Bruce D., 4,557,550, Cl. 350-96.150.
Simon, William: *See*—
Cantwell, Thomas; Simon, William; and Young, Bobby, 4,557,139, Cl. 73-40.700.
Simpkin, Dennis J.: *See*—
Marsh, John F.; Cleverley, John A.; and Simpkin, Dennis J., 4,557,872, Cl. 260-504.00A.
Simpson, Richard D. Level detector circuit for microcomputer devices. 4,558,232, Cl. 307-351.000.
Sims, Ronald I.: *See*—
Codd, Roger D.; Sims, Ronald I.; Olive, Robert B.; and Jobanputra, Amit S., 4,558,281, Cl. 324-433.000.
Siol, Werner: *See*—
Quis, Peter; Siol, Werner; Buechse, Joachim; and Rauch, Hubert, 4,558,084, Cl. 524-294.000.
Sircar, Shivaji; Conrad, Roger R.; and Ambs, William J., to Air Products and Chemicals, Inc. Binary ion exchanged type X zeolite adsorbent. 4,557,736, Cl. 55-62.000.
Six, Jorg; and Kobarg, Gerd, to Paul Hellerman GmbH. Tie strap, particularly for tying elongated objects. 4,557,023, Cl. 24-16.0PB.
Sixsmith, Herbert, to Creare Research & Development Inc. Gas thrust bearing. 4,557,611, Cl. 384-124.000.
Skantek Corporation: *See*—
Plasencia, Armand J.; Tusso, Robert J.; and Gilson, Alan P., 4,558,373, Cl. 358-285.000.
SKF Industries, Inc.: *See*—
Tallian, Tibor E.; and Hingley, Colin G., 4,557,613, Cl. 384-568.000.
SKF Kugellagerfabriken GmbH: *See*—
Brandenstein, Manfred; Haas, Roland; Herrmann, Gerhard; and Hans, Rudiger, 4,557,708, Cl. 474-112.000.
SKF Nova AB: *See*—
Lundgren, Bengt, 4,557,652, Cl. 411-230.000.
SKF (U.K.) Limited: *See*—
Neal, Hubert W. T., 4,557,612, Cl. 384-488.000.
Skiles, Jerry W.; Youssefyeh, Raymond D.; Suh, John T.; and Jones, Howard, to USV Pharmaceutical Corp. N-Substituted-amindo-amino acids. 4,558,038, Cl. 514-20.000.
Skiles, Richard D.: *See*—
Pilgram, Kurt H.; and Skiles, Richard D., 4,558,040, Cl. 514-150.000.
Slattery, Ian: *See*—
Ingram, Gary L.; and Slattery, Ian, 4,557,208, Cl. 112-266.200.
Small, Augustus B.: *See*—
Evans, Morris L.; and Small, Augustus B., 4,558,107, Cl. 526-237.000.
Smertin, Valentin P.: *See*—
Kontar, Evgeny A.; Soloviev, Sergei L.; Brovko, Viktor P.; Glukhikh, Rudolf G.; Khomyakov, Evgeny N.; Pakhomov, Jury F.; Khmeljuk, Alexei M.; Vyalykh, Vladimir I.; Zansokhov, Leonid G.; Smertin, Valentin P.; Evseev, Alexei I.; and Sharipov, Fyarit A., 4,557,697, Cl. 441-2.000.
Smith, George O. Waterproof axle system for a boat trailer. 4,557,526, Cl. 301-124.00R.
Smith, Ian K., to Solmecs Corporation. Method and apparatus for converting thermal energy. 4,557,112, Cl. 60-651.000.
Smith, James O.; Vetter, Ronald F.; and Sieg, George F., to United States of America, Navy. Pyrogen igniter. 4,557,197, Cl. 102-202.000.
Smith, Jimmy B.; and Liggett, Julian M., to Peabody Development Company. Formcoke process. 4,557,733, Cl. 44-10.00C.
Smith Kline & French Laboratories Limited: *See*—
Ganellin, Charon R.; Ife, Robert J.; and Owen, David A. A., 4,558,128, Cl. 544-320.000.
Smith, Nelson; and Stutts, Joseph W., to Ciba Geigy Corporation. Preparation of Fe chelates. 4,558,145, Cl. 556-148.000.
Smith, Richard L., to Allis-Chalmers Corporation. Weather louver. 4,557,740, Cl. 55-440.000.
Smythe, Mark E.: *See*—
Paciorek, Kazimiera J. L.; Kratzer, Reinhold H.; Harris, David H.; Smythe, Mark E.; and Nakahara, James H., 4,557,869, Cl. 260-349.000.
Snaidr, Stanislav M.: *See*—
Brackmann, Warren A.; and Snaidr, Stanislav M., 4,557,278, Cl. 131-109.100.
Snow, Kenneth T. Dialysis clamp. 4,557,262, Cl. 128-325.000.
S.A. des Etablissements Staubli: *See*—
Froment, Jean-Paul, 4,557,298, Cl. 139-71.000.
Societe Medi 2000 S.A.R.L.: *See*—
Pazzini, Norbert, 4,557,471, Cl. 269-325.000.
Soderholm, Arne, to S.E.G. Resistor AB. Belt weighing device with individually adjustable reels. 4,557,341, Cl. 177-16.000.
Sohne Armaturenfabrik GmbH & Co. KG: *See*—
Strangfeld, Reiner, 4,557,000, Cl. 4-324.000.
Soller, Jochen: *See*—
Koch, Eckhard; Vogg, Gunter; and Soller, Jochen, 4,557,648, Cl. 410-78.000.
Solmecs Corporation: *See*—
Smith, Ian K., 4,557,112, Cl. 60-651.000.
Solomon, Arieh, to Damar Holdings B.V. Metering and dispensing unit. 4,557,404, Cl. 222-325.000.
Soloviev, Sergei L.: *See*—
Kontar, Evgeny A.; Soloviev, Sergei L.; Brovko, Viktor P.; Glukhikh, Rudolf G.; Khomyakov, Evgeny N.; Pakhomov, Jury F.; Khmeljuk, Alexei M.; Vyalykh, Vladimir I.; Zansokhov, Leonid G.; Smertin, Valentin P.; Evseev, Alexei I.; and Sharipov, Fyarit A., 4,557,697, Cl. 441-2.000.
Solt, Clarence R., Jr., to McDonnell Douglas Corporation. Transducer multiplexer. 4,558,426, Cl. 364-580.000.
Solvik, R. Sven: *See*—
Carrick, Wayne L.; Solvik, R. Sven; and Kirch, William, 4,558,105, Cl. 526-68.000.
Sontheimer, Carl G. Method and apparatus for recording and retrieving video information in two modes on a single laser recording disc. 4,558,375, Cl. 358-342.000.
Sony Corporation: *See*—
Collins, Mark C.; and Ive, John G. S., 4,558,377, Cl. 360-10.100.
Honda, Sigemichi, 4,558,329, Cl. 346-76.0PH.
Nagumo, Fumio, 4,558,366, Cl. 358-213.000.
Narabu, Tadakuni; and Nakashio, Miaki, 4,558,341, Cl. 357-24.000.
Sasaki, Tadao, 4,558,349, Cl. 358-16.000.
Tanaka, Sadaaki, 4,558,354, Cl. 358-37.000.
Yamagiwa, Kazuo, 4,558,283, Cl. 328-160.000.
Sony Magnescale Incorporated: *See*—
Yonemoto, Hiroshi; Narimatsu, Akihisa; and Suzuki, Nobuyuki, 4,558,312, Cl. 340-680.000.
Sorensen, Ian W., to Allied Corporation. High conducting polymer-metal alloy blends. 4,557,857, Cl. 252-503.000.
Sota, Kaoru: *See*—
Hatayama, Katsuo; Yoshikawa, Kensei; Sano, Tatsuhiko; Ohuchi, Yutaka; Ota, Tomomi; Sekiuchi, Kazuto; and Sota, Kaoru, 4,557,871, Cl. 556-183.000.
South Eastern Electricity Board: *See*—
Fielden, John S., 4,558,303, Cl. 340-347.0AD.
Sovia, Rene D.: *See*—
Steiner, Charles W.; and Sovia, Rene D., 4,558,195, Cl. 200-83.00R.
Spacesaver Corporation: *See*—
Dahnert, Dean L., 4,557,534, Cl. 312-201.000.
Spalding, Willard P.: *See*—
Hart, James E.; Spalding, Willard P.; and Kyllonen, Allen W., 4,557,181, Cl. 91-519.000.
Spanek, Denis, to Chicago Wirecraft, Inc., a part interest. Rack for cooking foods such as artichokes. 4,557,188, Cl. 99-415.000.
Spang & Company: *See*—
Olmsted, Robert W.; and Huth, Joseph F., III, 4,558,295, Cl. 336-83.000.
Spector, George: *See*—
Clements, Ivan C.; and Spector, George, 4,557,477, Cl. 272-76.000.
Maclean, Ewen M.; and Spector, George, 4,557,518, Cl. 296-156.000.
Speicher, Edwin W., to M. E. Cunningham Company. Multiple movement marking machine. 4,557,191, Cl. 101-4.000.
Spence, David C.: *See*—
Gussow, Stanley; Spence, David C.; and Schwartz, William A., 4,558,168, Cl. 585-324.000.
Spencer Wright Industries, Inc.: *See*—
Ingram, Gary L.; and Slattery, Ian, 4,557,208, Cl. 112-266.200.
Sperry Corporation: *See*—
Hyman, Myles; Sheehan, Ronald T.; and Rowland-Hill, E. William, 4,557,276, Cl. 130-27.0AE.
Welch, Terry A., 4,558,302, Cl. 340-347.0DD.
Spiewak, John W.: *See*—
Page, Geoffrey A.; Tokoli, Emery G.; Cosgrove, Robert T.; and Spiewak, John W., 4,557,868, Cl. 260-245.890.
Spiliadis, Apostol: *See*—
Cioca, Gheorghe; Siegler, Marcel; and Spiliadis, Apostol, 4,557,855, Cl. 252-355.000.
Spinoglio, M. Mario: *See*—
Bournier, Edgard, 4,557,937, Cl. 426-241.000.
Spiro, Clifford L.: *See*—
McKee, Douglas W.; Spiro, Clifford L.; and Kosky, Philip G., 4,558,027, Cl. 502-181.000.
Spong, Richard V.: *See*—
Crowman, Stanley W. T.; Dornes, Bryan J.; Paukovits, Edward J., Jr.; Spong, Richard V.; and Talarico, Robert J., 4,557,044, Cl. 29-741.000.
Sprague, Robert A., to Xerox Corporation. Two dimensional electro-optic modulator for optical processing. 4,557,563, Cl. 350-162.120.
Springer, Jeffery T.: *See*—
Teach, Eugene G.; and Springer, Jeffery T., 4,557,756, Cl. 71-118.000.
Sproston, Robert L., Jr.: *See*—
Hendrickson, Melvin C.; and Sproston, Robert L., Jr., 4,558,360, Cl. 358-120.000.
Square D Company: *See*—
Rice, Paul D.; and Sharp, Jeffrey O., 4,557,095, Cl. 52-473.000.
Squire, Edward N., to Du Pont de Nemours, E. I., and Company. Perfluorodioxole and its polymers. 4,558,141, Cl. 549-455.000.
SSK Enterprises, Inc.: *See*—
Kara, Stephen, 4,558,386, Cl. 360-128.000.

Staack, Gerald F.: *See*—
Ford, James A.; Staack, Gerald F.; and Waite, Phillip, 4,557,414, Cl. 229-5.500.

Stackhouse, Wells F., to American Locker Security Systems, Inc. Coin operated lock unit. 4,557,365, Cl. 194-1.00G.

Stacpoole, Peter W., to University of Florida. Treatment of metabolic disorders with dichloroacetate-thiamine preparations. 4,558,050, Cl. 514-252.000.

Stahl, Benedict J.; and Hierman, Thomas L., to Stahl, Benedict J. Multiple-unit mail box. 4,557,416, Cl. 232-24.000.

Stahl, Douglas C., to GTE Automatic Electric Incorporated. Single power supply battery feed circuit. 4,558,186, Cl. 179-170.0NC.

Staller, Siegfried: *See*—
Christophliemk, Peter; von Laufenberg, Jurgen; Novotny, Rudolf; Staller, Siegfried; and Diekotter, Friedrich W., 4,557,907, Cl. 423-119.000.

Standard Oil Company, The: *See*—
Paparizos, Christos; Shout, Robert S.; and Shaw, Wilfrid G., 4,558,029, Cl. 502-211.000.
Paspek, Stephen C., Jr.; and Coker, Curtis D., 4,557,820, Cl. 208-8.0LE.
Russell, Delbert D.; and Yellig, William F., Jr., 4,557,330, Cl. 166-274.000.
Tenhover, Michael A.; Henderson, Richard S.; and Grasselli, Robert K., 4,557,766, Cl. 148-11.50P.

Standard Oil Company (Indiana): *See*—
Barkis, Edward D.; Moore, Douglas G.; Fernald, Allen M.; and McClellan, Felton L., 4,557,958, Cl. 428-36.000.

Standley, Paul M., to Dayco Corporation. Apparatus for making an endless power transmission belt construction. 4,557,680, Cl. 425-3.000.

Stanek, Earl A.: *See*—
Vernon, Caroline L.; and Stanek, Earl A., 4,557,960, Cl. 428-40.000.

Starski, Wojciech, to RCA Corporation. Component lead processing apparatus. 4,557,043, Cl. 29-741.000.

Stauffer Chemical Company: *See*—
DiSalvo, Anthony L.; and Kim, Ki-Soo, 4,557,860, Cl. 252-512.000.
Schachter, Rozalie; Viscogliosi, Marcello; and Bunz, Lewis A., 4,558,340, Cl. 357-23.700.
Teach, Eugene G.; and Springer, Jeffery T., 4,557,756, Cl. 71-118.000.

Ste LOOK: *See*—
Bernard, Jean; Beyl, Jean; Briee, Serge; and le Faou, Daniel, 4,557,499, Cl. 280-626.000.

Steenbergen, Anne: *See*—
Willemsen, Stephanus; Weening, Willem E.; and Steenbergen, Anne, 4,557,967, Cl. 428-224.000.

Steiner, Charles W.; and Sovia, Rene D., to Marley-Wylain Company, The. Apparatus and method for sensing high and low liquid level to control a circuit. 4,558,195, Cl. 200-83.00R.

Steinkuhl, Bernd: *See*—
Merten, Gerhard; Breuer, Oswald; Hesse, Norbert; and Steinkuhl, Bernd, 4,557,525, Cl. 299-93.000.

Stenberg, Johan E.: *See*—
Nygren, B. Hakan; Sandstrom, E. Torbjorn; Stenberg, Johan E.; and Stiblert, Lars B., 4,558,012, Cl. 436-501.000.

Stendel, Wilhelm: *See*—
Hagenmaier, Hans-Paul; Werner, Gerhard; Drautz, Hannelore; Holst, Hartwig; Zahner, Hans; Brandes, Wilhelm; Reinecke, Paul; Zoebelein, Gerhard; Stendel, Wilhelm; Andrews, Peter; and Schaller, Klaus, 4,558,139, Cl. 549-271.000.

Stengle, Nancy K.; and Hobbs, James W., to Phillips Petroleum Company. Fractional distillation process control. 4,557,806, Cl. 203-1.000.

Stephen, Robert L.: *See*—
Gregonis, Donald E.; Stephen, Robert L.; Coleman, Dennis L.; Hunter, Stephen K.; Hanover, Barry K.; and Harrow, Jeffrey J., 4,557,724, Cl. 604-49.000.

Stepper, Inc.: *See*—
Hannon, Charles N., 4,557,472, Cl. 271-133.000.

Sterling Drug Inc.: *See*—
Greene, Donald F.; and Urban, Virginia L., 4,557,898, Cl. 422-28.000.

Stern & Stern Textiles, Inc.: *See*—
Thornton, Peter B.; Cone, Stanley H.; and Booz, George W., 4,557,968, Cl. 428-229.000.

Sterner, Bengt J., to Telefonaktiebolaget LM Ericsson. Electrical safety device controlled by mutually independently generated pulse trains. 4,558,407, Cl. 363-132.000.

Steuernagel, Gernot; and Bohnenberger, Willy, to Licentia Patent-Verwaltungs-GmbH. Apparatus for connecting cables to printed circuit boards. 4,557,541, Cl. 339-17.0LM.

Steven, James H.: *See*—
Scott, Graham W.; and Steven, James H., 4,557,815, Cl. 204-182.200.

Stevens, Geoffrey C.: *See*—
Barclay, John L.; Stevens, Geoffrey C.; Stokes, Brian; and Ward, Denis S., 4,557,637, Cl. 406-153.000.

Stevenson, John S., to Texaco Inc. Dry feeder for finely divided solids into high pressure atmosphere. 4,557,403, Cl. 222-252.000.

Stewart, Norman L., Jr.; and Kranz, Ken E., to Farmland Industries, Inc. Method of lowering the magnesium impurity level of wet-process phosphoric acid during production of liquid fertilizer. 4,557,748, Cl. 71-32.000.

Stewart, Richard M. Core capping apparatus. 4,557,029, Cl. 29-253.000.

Stewart, Roger G., to RCA Corporation. Multi mode amplifier. 4,558,240, Cl. 307-530.000.

Stiberth, Lothar F.: *See*—
Ramp, Floyd L.; and Stiberth, Lothar F., 4,558,086, Cl. 524-399.000.

Stiblert, Lars B.: *See*—
Nygren, B. Hakan; Sandstrom, E. Torbjorn; Stenberg, Johan E.; and Stiblert, Lars B., 4,558,012, Cl. 436-501.000.

Stock, Robert A.; and Hayakar, Robert A., to Xerox Corporation. Label scanner assembly for labelling machines. 4,557,786, Cl. 156-350.000.

Stocker, Hans-Werner: *See*—
Volpert, Fritz; and Stocker, Hans-Werner, 4,557,956, Cl. 428-35.000.

Stockman, Robert M., to American Radionic Co., Inc. Capacitor unit with multiple selectable capacitance values. 4,558,394, Cl. 361-306.000.

Stoerk, Peter; and Thom, Gunter, to Siemens Aktiengesellschaft. Switch for optical light waveguides. 4,557,555, Cl. 350-96.200.

Stokes, Brian: *See*—
Barclay, John L.; Stevens, Geoffrey C.; Stokes, Brian; and Ward, Denis S., 4,557,637, Cl. 406-153.000.

Stolk, Gerritt: *See*—
Hensley, Gary L.; Van Dokkum, Jan; Groeneweg, Adrianus; and Stolk, Gerritt, 4,557,142, Cl. 73-153.000.

Stoller, Kenneth P.; and Taff, Barry E. Method and apparatus for detecting body illness, dysfunction, disease and/or pathology. 4,557,271, Cl. 128-734.000.

Stoller, Kenneth P.; and Taff, Barry E. Method and apparatus for detecting ovulation. 4,557,273, Cl. 128-738.000.

Stolzer, Paul, to Keuro Maschinenbau Gesellschaft mit beschrankter Haftung & Co. Kommanditgesellschaft. Machine tool, particularly band saw, with lightweight saw band carrier. 4,557,171, Cl. 83-796.000.

Stone Construction Equipment, Inc.: *See*—
DeNise, Richard A., 4,557,336, Cl. 173-90.000.

Stopinc Aktiengesellschaft: *See*—
Bachmann, Herbert, 4,557,462, Cl. 251-184.000.

Storage Technology Corporation: *See*—
Reishus, Terry, 4,557,435, Cl. 242-190.000.

Stout, Gregg W., to Baker Oil Tools, Inc. Well perforating method and apparatus. 4,557,331, Cl. 166-297.000.

Strangfeld, Reiner, to Rost, Georg; and Sohne Armaturenfabrik GmbH & Co. KG. Toilet-tank discharge valve. 4,557,000, Cl. 4-324.000.

Strangio, Vincent A.: *See*—
Riegel, Herbert; Huang, Chiung-Yuan; and Strangio, Vincent A., 4,558,167, Cl. 570-238.000.

Street, Ramon L.: *See*—
Dove, Derek B.; Makowka, Claus D.; and Street, Ramon L., 4,557,616, Cl. 400-120.000.

Striker, Richard A.: *See*—
Eckberg, Richard P.; Striker, Richard A.; and Modic, Frank J., 4,558,147, Cl. 556-427.000.

Strobel, Alfons; Wagner, Hans; and Hauser, Georg, to J. Strobel & Sohne GmbH & Co. Fur sewing machine with heated air blower. 4,557,205, Cl. 112-20.000.

Strom, Johan P., to U.S. Philips Corporation. Bi-axial supporting arrangement which can withstand high acceleration forces. 4,558,325, Cl. 343-765.000.

Strosberg, Arthur M.: *See*—
Kluge, Arthur F.; Clark, Robin D.; and Strosberg, Arthur M., 4,558,129, Cl. 544-377.000.

Strunck, Theo; and Fricke, Erich, to Gewerkschaft Eisenhutte Westfalia. Method of applying a corrosion-proof and wear-resistant coating to a workpiece. 4,557,808, Cl. 204-29.000.

Strupczewski, Joseph T., to Hoechst-Roussel Pharmaceuticals Inc. Analgesic 3-(4-piperidinyl)-1,2-benzisothiazoles. 4,558,056, Cl. 514-321.000.

Stuart, Robert A., to Rotaflex plc. Connector for electrical supply system. 4,557,547, Cl. 339-184.00R.

Stuckmayer, Jack. Farm game. 4,557,486, Cl. 273-278.000.

Stultz, Peter F.: *See*—
Lisutaud, James P.; Stultz, Peter F.; Maloney, David L.; and Westberg, John K., II, 4,558,270, Cl. 320-2.000.

Stumpe, Werner, to Robert Bosch GmbH. Electro-pneumatic brake system. 4,557,527, Cl. 303-15.000.

Stuparits, Jeffrey J.; and Cramer, Russell L. Arrangement for line jumper testing. 4,558,188, Cl. 179-175.20D.

Sturdevant, Eugene J.; and Daniels, John F., to Harry Hill Associates. Heating structure for an oven. 4,558,208, Cl. 219-399.000.

Stussi, Rudolf: *See*—
Mayer, Andreas; and Stussi, Rudolf, 4,557,226, Cl. 123-41.860.

Stutts, Joseph W.: *See*—
Smith, Nelson; and Stutts, Joseph W., 4,558,145, Cl. 556-148.000.

Suconick, David J.: *See*—
Gantley, Francis C.; Chervenic, Jack; and Suconick, David J., 4,558,171, Cl. 174-52.0FP.

Suefuji, Kazutaka: *See*—
Murayama, Akira; Kuno, Hiroaki; Uchikawa, Naoshi; Tamura, Takahiro; Mizuno, Takao; Kotani, Sumihisa; Tomita, Yoshikatsu; Arata, Tetsuya; Shibayashi, Masao; and Suefuji, Kazutaka, 4,557,675, Cl. 418-55.000.

Sugawara, Sakuo: *See*—
Hara, Masanori; Sugawara, Sakuo; Yamazaki, Kisuke; and Kasagi, Hiroshi, 4,557,247, Cl. 126-99.00R.

Sugihara, Hirosada; Watanabe, Masazumi; Kawada, Mitsuru; and Imada, Isuke, to Takeda Chemical Industries, Ltd. Spirobenzofuranones and their use in treating peptic ulcers. 4,558,068, Cl. 514-462.000.

Sugimoto, Yasuhiro, to Tokyo Shibaura Denki Kabushiki Kaisha. Gamma correction circuit. 4,558,363, Cl. 358-164.000.

Sugisawa, Ko; Yamamoto, Masanori; Shibuki, Masaru; Nomura, Yukihiro; Sengoku, Koji; Higashine, Seiji; and Hioki, Hiroko, to House Food Industrial Co. Ltd. Method for improving a hardly soluble gelling agent. 4,557,939, Cl. 426-473.000.

Sugitani, Hiroshi; Matsuda, Hiroto; and Ikeda, Masami, to Canon Kabushiki Kaisha. Liquid jet recording head. 4,558,333, Cl. 346-140.00R.

Sugiura, Susumu: *See*—
Toda, Katsuhiko; and Sugiura, Susumu, 4,558,356, Cl. 358-75.000.

Sugiyama, Hiroyuki, to Victor Company of Japan, Ltd. Digital video signal transmitting apparatus. 4,558,362, Cl. 358-138.000.

Suh, John T.: *See*—
Skiles, Jerry W.; Youssefyeh, Raymond D.; Suh, John T.; and Jones, Howard, 4,558,038, Cl. 514-20.000.

Sulzer Brothers Limited: *See*—
Hofstetter, Josef, 4,557,877, Cl. 261-97.000.

Sumitani, Koji; Sakai, Tokuji; Yamasaki, Yasuo; and Onodera, Tamio, to Teijin Petrochemical Industries Ltd. Production of crystalline zeolites. 4,557,919, Cl. 423-329.000.

Sumitomo Chemical Company, Limited: *See*—
Sasakura, Masaaki; and Imada, Kunihiko, 4,557,731, Cl. 8-531.000.

Sumitomo Electric Industries, Ltd.: *See*—
Daiguji, Hisashi; and Tanaka, Ikuo, 4,557,007, Cl. 14-22.000.
Ono, Kimizo; and Tsuno, Koichi, 4,557,598, Cl. 356-241.000.

Sun Studs, Inc.: *See*—
Shrum, Kenneth L., 4,557,304, Cl. 144-213.000.

Sunderhaus, Charles A., to Dover Corporation. Retainer ring for the spout of a fluid dispensing nozzle. 4,557,302, Cl. 141-207.000.

Sundman, Frey, to A. Ahlstrom Osakeyhtio. Apparatus for washing fibre stock. 4,557,120, Cl. 68-58.000.

Sundstrand Corporation: *See*—
Reynolds, Richard W., 4,557,160, Cl. 74-687.000.

Sundstrand Heat Transfer, Inc.: *See*—
Sweedyk, James M., 4,557,249, Cl. 126-110.00R.

Sung, Rodney L.; Zoleski, Benjamin H.; Sweeney, William M.; and Crawford, Wheeler C., to Texaco Inc. Crankcase lubricant. 4,557,848, Cl. 252-51.50R.

Sunshine, Abraham; Laska, Eugene M.; and Siegel, Carole E., to Richardson-Vicks, Inc. Analgesic and anti-inflammatory compositions comprising xanthines and methods of using same. 4,558,051, Cl. 514-261.000.

Superior Electric Company, The: *See*—
Borowy, Dennis M.; Crotty, Charles A.; Perrins, Allen R.; and Senak, Peter, Jr., 4,558,275, Cl. 324-103.00P.

Suroff, Leonard W.: *See*—
Kolt, Stanley, 4,557,183, Cl. 98-42.160.

Susa, Naomi R.; and Porter, Samuel, Jr., to PPG Industries, Inc. High-solids coating composition for improved rheology control containing organo-modified clay. 4,558,075, Cl. 523-216.000.

Suzuki, Akira: *See*—
Takamiya, Sanshiro; Yoshizawa, Michisuke; and Suzuki, Akira, 4,556,997, Cl. 623-3.000.

Suzuki, Fumio; Ohnuma, Toshio; Koga, Kazuyuki; and Watanabe, Tatsuya, to Fujikura Ltd. System for automatically arranging ends of wires of connector cable in predetermined order. 4,557,046, Cl. 29-749.000.

Suzuki, Kenji: *See*—
Yokoyama, Yasuyuki; Hatano, Takayoshi; Suzuki, Kenji; and Fujioka, Koichiro, 4,557,592, Cl. 355-51.000.

Suzuki, Nobuyuki: *See*—
Yonemoto, Hiroshi; Narimatsu, Akihisa; and Suzuki, Nobuyuki, 4,558,312, Cl. 340-680.000.

Suzuki, Osamu: *See*—
Komiyama, Choji; Oishi, Kengo; Suzuki, Osamu; and Iyota, Yasumasa, 4,557,380, Cl. 206-387.000.

Suzuki, Shinji: *See*—
Miyake, Toshio; Hijiya, Hiromi; Suzuki, Shinji; and Matsumoto, Teruo, 4,557,927, Cl. 424-48.000.

Suzuki, Shizuo: *See*—
Takayanagi, Takeshi; Suzuki, Shizuo; Minowa, Susumu; and Nozaki, Yoshihiko, 4,557,316, Cl. 164-517.000.

Suzuki, Takashi, to Canon Kabushiki Kaisha. Beam splitter for a single lens reflex camera. 4,557,580, Cl. 354-406.000.

Suzuki, Teisuke, to JAC Creative Foods, Inc. Fish slurry processing method. 4,557,940, Cl. 426-513.000.

Suzuki, Yasoji; and Matsuo, Kenji, to Tokyo Shibaura Denki Kabushiki Kaisha. Complementary MOSFET logic circuit. 4,558,234, Cl. 307-446.000.

Suzuki, Yasuaki: *See*—
Suzuki, Yasuo; Hirao, Hiroshi; and Suzuki, Yasuaki, 4,558,241, Cl. 307-530.000.

Suzuki, Yasuo; Hirao, Hiroshi; and Suzuki, Yasuaki, to Fujitsu Limited. Sense amplifier. 4,558,241, Cl. 307-530.000.

Suzuki, Yoshihisa: *See*—
Morishita, Toshio; Yasui, Yoshiharu; Suzuki, Yoshihisa; Seiki, Kazuo; and Nakamura, Haruyoshi, 4,557,022, Cl. 19-267.000.

Swan, Paul J.: *See*—
Rabe, Robert L.; and Swan, Paul J., 4,558,237, Cl. 307-475.000.

Swanson, Robert R., to AT&T Technologies, Inc. Methods of securing an adhesive strip to a carrier. 4,557,782, Cl. 156-250.000.

Sweany, Louis P.: *See*—
Black, Donald E.; Sweany, Louis P.; and Pirtle, James D., 4,558,305, Cl. 340-384.00E.

Sweedyk, James M., to Sundstrand Heat Transfer, Inc. Compact high efficiency furnace. 4,557,249, Cl. 126-110.00R.

Sweeney, Cecilia: *See*—
Wittes, James M.; and Sweeney, Cecilia, 4,557,825, Cl. 209-3.000.

Sweeney, William M.: *See*—
Sung, Rodney L.; Zoleski, Benjamin H.; Sweeney, William M.; and Crawford, Wheeler C., 4,557,848, Cl. 252-51.50R.

Swiss Aluminium Ltd.: *See*—
Wagner, Alfred; and Ames, Adolf, 4,557,131, Cl. 72-273.000.

SWS Silicones Corporation: *See*—
McAfee, Richard C., 4,558,109, Cl. 528-15.000.

Sybron Corporation: *See*—
Probst, Robert L.; and Groves, William A., 4,557,376, Cl. 206-219.000.

Syntex (U.S.A.) Inc.: *See*—
Kluge, Arthur F.; Clark, Robin D.; and Strosberg, Arthur M., 4,558,129, Cl. 544-377.000.
Waterbury, L. David, 4,558,066, Cl. 514-422.000.

Synthelabo: *See*—
Kaplan, Jean-Pierre, 4,558,062, Cl. 514-400.000.

Sysmed, Inc.: *See*—
Broadhurst, John H.; and Bacaner, Marvin B., 4,558,223, Cl. 250-374.000.

Szczupak, David T., to Helsel Engineering Company Limited. Variable inlet area turbine. 4,557,665, Cl. 415-158.000.

T.A.D. Avanti, Inc.: *See*—
Bond, Raymond G., 4,558,179, Cl. 179-6.030.

Tabata, Toshio, to Pioneer Electronic Corporation. Counter circuit having improved output response. 4,558,457, Cl. 377-107.000.

Tachi, Susumu: *See*—
Kaneko, Makoto; Tachi, Susumu; and Komoriya, Kiyoshi, 4,558,215, Cl. 250-222.100.

Tachikawa Spring Co., Ltd.: *See*—
Isikawa, Yasuo, 4,557,522, Cl. 297-452.000.

Taff, Barry E.: *See*—
Stoller, Kenneth P.; and Taff, Barry E., 4,557,271, Cl. 128-734.000.
Stoller, Kenneth P.; and Taff, Barry E., 4,557,273, Cl. 128-738.000.

Tahayeri, Akbar: *See*—
Weiss, Lawrence H.; and Tahayeri, Akbar, 4,558,315, Cl. 340-802.000.

Tai, Tadashi: *See*—
Irie, Reiko F.; Tai, Tadashi; Morton, Donald L.; Cahan, Leslie D.; and Paulson, James C., 4,557,931, Cl. 424-88.000.

Taisho Pharmaceutical Co., Ltd.: *See*—
Hatayama, Katsuo; Yoshikawa, Kensei; Sano, Tatsuhiko; Ohuchi, Yutaka; Ota, Tomomi; Sekiuchi, Kazuto; and Sota, Kaoru, 4,557,871, Cl. 556-183.000.

Taka, Yuichi: *See*—
Iwata, Masahiro; Miyashita, Yushi; and Taka, Yuichi, 4,557,618, Cl. 401-34.000.

Takada, Junji; Minamitake, Masayuki; and Tamegai, Satoshi, to Tokyo Shibaura Denki Kabushiki Kaisha; and Toshiba Components Co. Voltage detecting circuit with hysteresis characteristic and high noise immunity. 4,558,226, Cl. 250-551.000.

Takada, Norihisa: *See*—
Nelson, Philip E.; and Takada, Norihisa, 4,557,799, Cl. 159-44.000.

Takagiwa, Hiroyuki; Takahashi, Jiro; Shirose, Meizo; Inaba, Naomi; and Seki, Megumi, to Konishiroku Photo Industry Co., Ltd. Toner for development of electrostatic image containing binder resin and wax. 4,557,991, Cl. 430-109.000.

Takahashi, Hiroshi, to Canon Kabushiki Kaisha. Ink jet printer. 4,558,332, Cl. 346-140.00R.

Takahashi, Jiro: *See*—
Takagiwa, Hiroyuki; Takahashi, Jiro; Shirose, Meizo; Inaba, Naomi; and Seki, Megumi, 4,557,991, Cl. 430-109.000.

Takahashi, Masaki; Hattori, Yuji; and Igarashi, Yuriko, to Kureha Kagaku Kogyo Kabushiki Kaisha. Microencapsulated agricultural chemical and process of preparation thereof. 4,557,755, Cl. 71-100.000.

Takahashi, Tadashi: *See*—
Hayashida, Hiroshi; Takahashi, Tadashi; and Miyashita, Kunio, 4,558,265, Cl. 318-561.000.

Takahashi, Yosuke: *See*—
Amemori, Koichi; Takahashi, Yosuke; Miyazaki, Manabu; Tsukahara, Hiroaki; Kawabe, Toshihiko; and Banba, Toshio, 4,557,235, Cl. 123-367.000.

Takahasi, Toshinori: *See*—
Takanashi, Itsuo; Tanaka, Hideshi; Tsumiyama, Hisanori; Mizuno, Yoshio; Ohara, Terumi; Kato, Shigeru; Takahasi, Toshinori; and Kiuchi, Tsutomu, 4,558,328, Cl. 346-76.0PH.

Takamatsu, Yoshikazu: *See*—
Kondo, Hiroshi; Nadamoto, Hiroyasu; and Takamatsu, Yoshikazu, 4,557,324, Cl. 165-174.000.

Takamiya, Sanshiro; Yoshizawa, Michisuke; and Suzuki, Akira, to Aisin Seiki Kabushiki Kaisha. Apparatus for driving medical appliances. 4,556,997, Cl. 623-3.000.

Takanashi, Itsuo; Tanaka, Hideshi; Tsumiyama, Hisanori; Mizuno, Yoshio; Ohara, Terumi; Kato, Shigeru; Takahasi, Toshinori; and Kiuchi, Tsutomu, to Victor Company of Japan, Ltd. High resolution thermal ink transfer printer. 4,558,328, Cl. 346-76.0PH.

Takatsu, Haruyoshi; and Sato, Hisato, to Dainippon Ink and Chemicals, Inc. Nematic liquid crystalline compounds. 4,558,151, Cl. 560-118.000.

Takaya, Takao; and Tozuka, Zenzaburo, to Fujisawa Pharmaceutical Co., Ltd. 3,5-Di hydroxy morpholine derivatives and pharmaceutical compositions. 4,558,047, Cl. 514-229.000.

Takayama, Nobutoshi: *See*—
Edakubo, Hiroo; Takayama, Nobutoshi; and Takimoto, Hiroyuki, 4,558,382, Cl. 360-77.000.
Takayanagi, Takeshi; Suzuki, Shizuo; Minowa, Susumu; and Nozaki, Yoshihiko, to Agency of Industrial Science & Technology; and Ministry of International Trade & Industry. Method for manufacture of investment shell mold suitable for casting grain-oriented super alloy. 4,557,316, Cl. 164-517.000.
Takeda Chemical Industries, Ltd.: *See*—
Kudo, Shiro; and Akaba, Kunihisa, 4,557,936, Cl. 426-104.000.
Sugihara, Hirosada; Watanabe, Masazumi; Kawada, Mitsuru; and Imada, Isuke, 4,558,068, Cl. 514-462.000.
Takeda, Kenji: *See*—
Inagaki, Mitsuo; Ito, Seitoku; Takeda, Kenji; and Kurokawa, Yoshiki, 4,557,670, Cl. 417-299.000.
Takenaka, Toichi: *See*—
Imai, Kazuo; Niigata, Kunihiro; Fujikura, Takashi; Hashimoto, Shinichi; and Takenaka, Toichi, 4,558,156, Cl. 564-85.000.
Takeshita, Isao: *See*—
Ando, Eiji; Goto, Yoshiki; Moriyama, Kumiko; Takeshita, Isao; and Hirao, Kunio, 4,557,850, Cl. 252-68.000.
Takeuchi, Eiichi; and Hara, Kazuya, to Casio Computer Co., Ltd. Sheet-like compact electronic equipment. 4,558,427, Cl. 364-708.000.
Takeuchi, Hiroo; Hachiro, Nobuaki; and Miyazaki, Yoshihisa, to Nissin Kogyo Kabushiki Kaisha. Vacuum booster device. 4,557,179, Cl. 91-369.00A.
Takeuchi, Hiroshi, to Kabushiki Kaisha Daikin Seisakusho. Damper disc assembly for clutch. 4,557,702, Cl. 464-68.000.
Takimoto, Hiroyuki: *See*—
Edakubo, Hiroo; Takayama, Nobutoshi; and Takimoto, Hiroyuki, 4,558,382, Cl. 360-77.000.
Takizawa, Yoshiyuki: *See*—
Aizawa, Koki; Takizawa, Yoshiyuki; Haeno, Akira; and Motoyama, Akira, 4,558,213, Cl. 250-214.00R.
Talarico, Robert J.: *See*—
Crowman, Stanley W. T.; Dornes, Bryan J.; Paukovits, Edward J., Jr.; Spong, Richard V.; and Talarico, Robert J., 4,557,044, Cl. 29-741.000.
Talbert, Sherwood G.; Flanigan, Lawrence J.; Corliss, John M.; Hagopian, John G.; and Nunheimer, Thomas P., to Atlantic Richfield Company. Solar collector employing conventional siding, and air distribution system therefor. 4,557,253, Cl. 126-429.000.
Talcott, Thomas D., to Boehringer Mannheim Corporation. Low oiling gel filled articles, siloxane gels and liquids therefor, and methods for producing same. 4,558,112, Cl. 528-31.000.
Tallian, Tibor E.; and Hingley, Colin G., to SKF Industries, Inc. Spherical roller bearing having reciprocal crowning for skew control. 4,557,613, Cl. 384-568.000.
Talon, Inc.: *See*—
Fisher, Harry M.; and Fisher, Stuart N., 4,557,027, Cl. 29-33.200.
Tamagnone, Gian F.: *See*—
Cannata, Vincenzo; and Tamagnone, Gian F., 4,557,866, Cl. 260-239.30P.
Tamegai, Satoshi: *See*—
Takada, Junji; Minamitake, Masayuki; and Tamegai, Satoshi, 4,558,226, Cl. 250-551.000.
Tamura, Takahiro: *See*—
Murayama, Akira; Kuno, Hiroaki; Uchikawa, Naoshi; Tamura, Takahiro; Mizuno, Takao; Kotani, Sumihisa; Tomita, Yoshikatsu; Arata, Tetsuya; Shiibayashi, Masao; and Suefuji, Kazutaka, 4,557,675, Cl. 418-55.000.
Tamura, Yoshitomo: *See*—
Yoshida, Muneo; and Tamura, Yoshitomo, 4,557,816, Cl. 204-255.000.
Tanabe, Osami: *See*—
Aoki, Kozo; Ogawa, Akira; and Tanabe, Osami, 4,557,999, Cl. 430-385.000.
Tanaka, Hideshi: *See*—
Takanashi, Itsuo; Tanaka, Hideshi; Tsumiyama, Hisanori; Mizuno, Yoshio; Ohara, Terumi; Kato, Shigeru; Takahasi, Toshinori; and Kiuchi, Tsutomu, 4,558,328, Cl. 346-76.0PH.
Tanaka, Ikuo: *See*—
Daiguji, Hisashi; and Tanaka, Ikuo, 4,557,007, Cl. 14-22.000.
Tanaka, Junichi; Furubayashi, Hisatoshi; Watanabe, Masanori; and Hijikigawa, Masaya, to Sharp Kabushiki Kaisha. Moisture sensor. 4,558,393, Cl. 361-286.000.
Tanaka, Norio; Taniguchi, Masakazu; Baba, Masatoshi; Ikai, Takashi; Nawamaki, Tsutomu; and Matsunaga, Masaji, to Nissan Chemical Industries Ltd. Herbicidal 4-benzoyl-1-methyl-5-phenylalkoxy pyrazoles. 4,557,753, Cl. 71-92.000.
Tanaka, Sadaaki, to Sony Corporation. Delay circuit. 4,558,354, Cl. 358-37.000.
Tanaka, Shuji; Nakamura, Shigehira; Sakamoto, Tuneaki; Hirakata, Yoshiaki; and Yamagata, Tetsuo, to Honda Giken Kogyo Kabushiki Kaisha. Audio apparatus for vehicle. 4,558,460, Cl. 381-86.000.
Tanaka, Tatsuo, to Kabushiki Kaisha Toshiba. Signal processing circuit. 4,558,287, Cl. 330-257.000.
Tanaka, Toshiaki: *See*—
Etoh, Yukihiro; Tanaka, Toshiaki; Kanesaki, Nobukazu; and Miyazaki, Hiroaki, 4,557,230, Cl. 123-263.000.
Tanaka, Toshihiro, to Kabushiki Kaisha Komatsu Seisakusho. Finger apparatus for an idle station in a transfer press. 4,557,370, Cl. 198-621.000.
Tanaka, Yasuhiko: *See*—
Kimura, Yoshiaki; and Tanaka, Yasuhiko, 4,558,326, Cl. 346-1.100.
Tanaka, Yoshikazu; Yamamuro, Sigeaki; Abo, Keiju; Hirano, Hiroyuki; Kumura, Haruyoshi; and Morimoto, Yoshiro, to Nissan Motor Co., Ltd. Control system for continuously variable V-belt transmission. 4,557,706, Cl. 474-28.000.
Taniguchi, Masakazu: *See*—
Tanaka, Norio; Taniguchi, Masakazu; Baba, Masatoshi; Ikai, Takashi; Nawamaki, Tsutomu; and Matsunaga, Masaji, 4,557,753, Cl. 71-92.000.
Tanner, John G., to Boeing Company, The. Shield stripper for electrical wiring. 4,557,163, Cl. 81-9.440.
Tano, Eiichi; Kobayashi, Takeo; and Negishi, Kiyoshi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Photographing mode display switching circuit. 4,557,575, Cl. 354-289.100.
Tapco Products Company, Inc.: *See*—
Break, Douglas G., 4,557,132, Cl. 72-319.000.
Tavares, Luiz M. C. Magnetic seal system for belt conveyor rollers. 4,557,490, Cl. 277-80.000.
Taylor, Allan H.: *See*—
Jackson, L. Robert; and Taylor, Allan H., 4,557,444, Cl. 244-172.000.
Taylor, Chandler R., Jr.; and Lo, Young S., to A. H. Robins Company, Incorporated. Nitro, amino and aroylamino-N-phenylpyridinamines in a process for preparing pyrido[1,4]benzodiazepines. 4,558,132, Cl. 546-262.000.
Taylor, Tillman F., Jr.: *See*—
Schoonover, David J.; and Taylor, Tillman F., Jr., 4,557,899, Cl. 422-55.000.
TDK Corporation: *See*—
Shiba, Haruo; and Iizuka, Michio, 4,558,387, Cl. 360-132.000.
Shigeta, Masao; and Ojima, Teruhiko, 4,558,297, Cl. 336-213.000.
Teach, Eugene G.; and Springer, Jeffery T., to Stauffer Chemical Company. Meta-anilide and meta-anilide urea herbicidal compounds and methods of use. 4,557,756, Cl. 71-118.000.
Technicare Corporation: *See*—
Buffington, Ralph M.; Kaminski, Perry; and Larson, Eugene A., 4,557,146, Cl. 73-642.000.
Teepak, Inc.: *See*—
Martinek, Thomas W., 4,557,018, Cl. 17-49.000.
Teetz, Volker; Urbach, Hansjorg; and Becker, Reinhard, to Hoechst Aktiengesellschaft. 2-Azasfiro[4.(3+N)]-3-carboxylic acid derivatives, a process for their preparation, agents containing these derivatives and their use. 4,558,064, Cl. 514-409.000.
Teijin Limited: *See*—
Nouda, Hiroshi; Hasegawa, Kinji; and Hosoi, Masahiro, 4,557,982, Cl. 428-694.000.
Teijin Petrochemical Industries Ltd.: *See*—
Sumitani, Koji; Sakai, Tokuji; Yamasaki, Yasuo; and Onodera, Tamio, 4,557,919, Cl. 423-329.000.
Tektronix, Inc.: *See*—
Culter, Robert G., 4,558,372, Cl. 358-264.000.
DenBeste, Steven C.; Boyce, Douglas G.; Blattner, John D.; and Hillen, Kenneth K., 4,558,422, Cl. 364-480.000.
Tekudaiya Kabushiki Kaisha: *See*—
Koyama, Etsuo; and Nakamura, Kazuhiro, 4,558,443, Cl. 369-139.000.
Telefonaktiebolaget LM Ericsson: *See*—
Sterner, Bengt J., 4,558,407, Cl. 363-132.000.
Telefunken Electronic GmbH: *See*—
Burgeth, Heinz; Leitner, Georg; and Wolf, Joachim, 4,558,191, Cl. 200-5.00A.
Tella, Richard P. Robotic wrist. 4,557,623, Cl. 403-31.000.
Tellman, Stephen J.: *See*—
Bower, Richard K.; and Tellman, Stephen J., 4,557,779, Cl. 156-219.000.
Tenhover, Michael A.; Henderson, Richard S.; and Grasselli, Robert K., to Standard Oil Company. Bulk amorphous metal alloy objects and process for making the same. 4,557,766, Cl. 148-11.50P.
Tennant-Company: *See*—
Fortman, Lloyd D.; and Kinter, Mark D., 4,557,739, Cl. 55-320.000.
Tenneco Inc.: *See*—
Petrak, Harry A., 4,557,358, Cl. 192-35.000.
Tennessee Valley Authority: *See*—
Mair, Alexander D., 4,557,909, Cl. 423-167.000.
Tenud, Leander; and Jolidon, Synese, to Lonza Ltd. Process for the production of 4-(trialkylammonium)-acetoacetarylides. 4,558,158, Cl. 564-194.000.
Tenyo Co., Ltd.: *See*—
Kato, Hideo, 4,557,476, Cl. 272-8.00N.
Teramachi, Hiroshi. Rotary-to-linear converter with rolling balls, and feed mechanisms incorporating the same. 4,557,156, Cl. 74-459.000.
Teramachi, Hiroshi. Curvilinear bearing unit. 4,557,532, Cl. 308-6.00C.
Terauchi, Tsuneo; and Masuda, Yoshikazu, to Mitsubishi Denki Kabushiki Kaisha. Industrial robot. 4,557,662, Cl. 414-744.00R.
Ternan, Marten; and Parsons, Basil I., to Canada, Her Majesty the Queen in right of Canada, as represented by the Minister of Energy, Mines and Resources of. High porosity catalyst. 4,558,031, Cl. 502-355.000.
Teshima, Koichi: *See*—
Kanto, Masaharu; Kihara, Hisato; Teshima, Koichi; and Inaba, Michihiko, 4,558,252, Cl. 313-402.000.
Test, Dan, to C & K Components, Inc. Switch lock. 4,558,193, Cl. 200-43.050.
Tetra Pak Developpement SA: *See*—
Rausing, Anders R.; and Nilsson, Erling I., 4,557,888, Cl. 264-230.000.
Texaco Inc.: *See*—
Grigsby, Robert A., Jr.; and Knifton, John F., 4,558,072, Cl. 518-701.000.

McCoy, David R.; and Naylor, Carter G., 4,558,159, Cl. 564-233.000.
Stevenson, John S., 4,557,403, Cl. 222-252.000.
Sung, Rodney L.; Zoleski, Benjamin H.; Sweeney, William M.; and Crawford, Wheeler C., 4,557,848, Cl. 252-51.50R.

Texas Instruments Incorporated: *See*—
Fuller, Gene E.; and Lin, Yi-Ching, 4,557,797, Cl. 156-643.000.
Saunier, Paul; and Shih, Hung-Dah, 4,558,337, Cl. 357-22.000.
Wand, Martin A., 4,558,304, Cl. 340-347.0SY.
White, William A.; and Namordi, Mooshi R., 4,558,235, Cl. 307-450.000.

Thermal Dynamics Corporation: *See*—
Hatch, Bruce O., 4,558,201, Cl. 219-121.0PM.

Thermco Systems, Inc.: *See*—
Foster, Thomas C.; Goldman, Jon C.; and Hoeye, Gary W., 4,557,950, Cl. 427-255.000.

Thery, Georges E. Combustion chamber of a reciprocating internal combustion engine which promotes a rotary combustion turbulence. 4,557,231, Cl. 123-279.000.

Theuwis, Alfons L.: *See*—
Plessers, Jacques J.; and Theuwis, Alfons L., 4,557,152, Cl. 73-864.550.

Thies, Peter: *See*—
Fudickar, Harald; and Thies, Peter, 4,557,791, Cl. 156-580.000.

Thigpen, Lawrence E., to Polaroid Corporation. Polarized optical fiber and method of forming same. 4,557,742, Cl. 65-2.000.

Thom, Gunter: *See*—
Stoerk, Peter; and Thom, Gunter, 4,557,555, Cl. 350-96.200.

Thoma, Friedrich X., to Dieter Graesslin Feinwerktechnik. Multi-range timer switch device. 4,558,192, Cl. 200-35.00R.

Thomas, Charles E.: *See*—
Batchelder, Clarence F.; Thomas, Charles E.; and Casady, Kent B., 4,557,178, Cl. 91-367.000.

Thomas, Gerald A.; and Askins, William E., to Woodstream Corporation. Padded leghold trap. 4,557,068, Cl. 43-90.000.

Thomas, Lowell S., to Dow Chemical Company, The. Carbonate polymer containing an ignition depressant composition. 4,558,081, Cl. 524-100.000.

Thomas, Stephen R.: *See*—
Ackerman, Jerome L.; Clark, Leland C., Jr.; and Thomas, Stephen R., 4,558,279, Cl. 324-315.000.

Thomey, Henry W., to Dyneer Corporation. Belt tensioner. 4,557,707, Cl. 474-101.000.

Thompson, David A.: *See*—
Fay, Robert C.; and Thompson, David A., 4,558,144, Cl. 556-40.000.

Thompson, James O. Featured price card holder. 4,557,064, Cl. 40-10.00R.

Thompson, Kathryn L.; Zambias, Robert A.; Hammond, Milton L.; and Chang, Michael N., to Merck & Co., Inc. Phenylthiomethyl-6-hydroxy-2,3-dihydrobenzo-pyran and analogs thereof useful as anti-inflammatory agents. 4,558,067, Cl. 514-458.000.

Thomsen, Svend E.: *See*—
Petersen, Hans C.; Kyster, Erik; and Thomsen, Svend E., 4,557,676, Cl. 418-61.00B.

Thomson CSF: *See*—
Catros, Jean-Yves, 4,558,361, Cl. 358-136.000.

Thoren, Stellan, to ASEA Aktiebolag. Sound damping devices. 4,558,296, Cl. 336-100.000.

Thornton, Peter B.; Cone, Stanley H.; and Booz, George W., to Stern & Stern Textiles, Inc. Directional electrostatic dissipating fabric and method. 4,557,968, Cl. 428-229.000.

Thrush, Roger L., to AMP Incorporated. Edge connector for chip carrier. 4,557,548, Cl. 339-258.00P.

Thurnau, Vernon L.; and Mariano, Arturo, to Butler Manufacturing Company. Deformable centering sleeve for tab of roof panel attachment clip unit. 4,557,098, Cl. 52-712.000.

Thyssen Industrie AG: *See*—
Wcislo, Manfred; Breitenbach, Otto; Schatz, Friedrich; and Riepling, Ulrich, 4,557,038, Cl. 29-596.000.

Tietz, Ernst: *See*—
Werkmeister, Johannes; and Tietz, Ernst, 4,557,165, Cl. 82-2.700.

Tijburg, Rudolf P.: *See*—
dePoorter, Johannes A.; deWaard, Peter J.; Tijburg, Rudolf P.; and Dinghs, Gerardus L., 4,558,448, Cl. 372-44.000.

Tiller, Charles R.: *See*—
Koehl, Stephen E.; and Tiller, Charles R., 4,558,280, Cl. 324-399.000.

Tinholt, Thomas H., to Eaton Corporation. Torsion damping mechanism with a viscous coupling. 4,557,357, Cl. 192-3.210.

Tinkle, Anthony R.: *See*—
Meeder, Charles A.; Tinkle, Anthony R.; and Wener, Kenneth R., 4,558,437, Cl. 367-15.000.

Tishken Products Co.: *See*—
Lash, Edward G.; Levy, Roger; and Nickels, Charles J., 4,557,129, Cl. 72-176.000.

Toa Medical Electronic Co., Ltd.: *See*—
Iwata, Toyotaro; Nakajima, Kunio; and Otsuki, Hiroyuki, 4,557,154, Cl. 74-89.210.

Tocci, Mario P.: *See*—
Shiuh, Jerome C.; and Tocci, Mario P., 4,557,883, Cl. 264-43.000.

Toda, Hideo: *See*—
Kihara, Kunio; Toda, Hideo; Mori, Motokuni; and Morooka, Koji, 4,557,930, Cl. 424-79.000.

Toda, Katsuhiko; and Sugiura, Susumu, to Canon Kabushiki Kaisha. Color printer. 4,558,356, Cl. 358-75.000.

Todd, Robert J.: *See*—
Reynolds, Gordon S.; Todd, Robert J.; and Russell, Edward J., 4,557,269, Cl. 128-675.000.

Tohda, Hiroyuki: *See*—
Aoyama, Toshimi; Tohda, Hiroyuki; Kato, Kazuo; and Nakane, Hisashi, 4,557,996, Cl. 430-324.000.

Toillie, Alain; and Wolff, Michel, to Kuhn S.A. Mower, and method of manufacturing its transmission shaft. 4,557,104, Cl. 56-13.600.

Tojo, Toru: *See*—
Gotou, Mineo; Yoshikawa, Ryoichi; Tojo, Toru; and Wada, Hirotsugu, 4,558,225, Cl. 250-491.100.

Tokiwa, Toru, to Amada Company, Limited. Method and apparatus for detecting the cutting resistance in bandsaw machines. 4,557,168, Cl. 83-56.000.

Tokoli, Emery G.: *See*—
Page, Geoffrey A.; Tokoli, Emery G.; Cosgrove, Robert T.; and Spiewak, John W., 4,557,868, Cl. 260-245.890.

Tokumitsu, Kiyonori, to Mitsubishi Denki Kabushiki Kaisha. Liquid-seal type motor having insulating oil pressure compensation. 4,558,246, Cl. 310-87.000.

Tokumitsu, Kiyonori: *See*—
Yamamoto, Sakuei; and Tokumitsu, Kiyonori, 4,558,247, Cl. 310-87.000.

Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Ariizumi, Syoji; Fukatsu, Yasushi; and Masuoka, Fujio, 4,558,343, Cl. 357-51.000.
Fukushi, Yukihiro, 4,557,589, Cl. 355-14.0SH.
Gotou, Mineo; Yoshikawa, Ryoichi; Tojo, Toru; and Wada, Hirotsugu, 4,558,225, Cl. 250-491.100.
Hasegawa, Masumi, 4,557,677, Cl. 418-63.000.
Kanto, Masaharu; Kihara, Hisato; Teshima, Koichi; and Inaba, Michihiko, 4,558,252, Cl. 313-402.000.
Katsumata, Kenichiro; and Nobuta, Yasuo, 4,558,458, Cl. 378-20.000.
Matsuda, Waka; and Kagawa, Tatsuo, 4,557,890, Cl. 376-282.000.
Miyake, Setsuo, 4,558,258, Cl. 315-5.390.
Sasaki, Itsuo; and Matsuo, Kenji, 4,558,292, Cl. 333-173.000.
Sugimoto, Yasuhiro, 4,558,363, Cl. 358-164.000.
Suzuki, Yasoji; and Matsuo, Kenji, 4,558,234, Cl. 307-446.000.
Takada, Junji; Minamitake, Masayuki; and Tamegai, Satoshi, 4,558,226, Cl. 250-551.000.
Yasuda, Hiroshi; and Marui, Kuniyoshi, 4,558,178, Cl. 179-2.00E.
Yokota, Tsuneshi; and Nakagawa, Akira, 4,558,441, Cl. 369-59.000.

Tolentino, Luisito A., to General Electric Company. Method for preparing acrylic functional halosilanes and halosiloxanes. 4,558,111, Cl. 528-26.000.

Tomalia, Donald A.; and Dewald, James R., to Dow Chemical Company, The. Dense star polymer. 4,558,120, Cl. 528-363.000.

Tomasi, Jean-Pierre, to U.S. Philips Corporation. Radar system operating by means of frequency modulated pulsed waves. 4,558,322, Cl. 343-17.20R.

Tome, James J.: *See*—
Schaefer, Richard M.; and Tome, James J., 4,557,505, Cl. 283-81.000.

Tomihashi, Nobuyuki: *See*—
Ohmori, Akira; Tomihashi, Nobuyuki; and Kitahara, Takahiro, 4,557,562, Cl. 350-96.340.

Tomita, Yasuo, to Canon Kabushiki Kaisha. System for recording patterns of magnetically recorded information by utilizing the magneto-optic effect. 4,558,440, Cl. 369-13.000.

Tomita, Yoshikatsu: *See*—
Murayama, Akira; Kuno, Hiroaki; Uchikawa, Naoshi; Tamura, Takahiro; Mizuno, Takao; Kotani, Sumihisa; Tomita, Yoshikatsu; Arata, Tetsuya; Shiibayashi, Masao; and Suefuji, Kazutaka, 4,557,675, Cl. 418-55.000.

Tomlin, James S.: *See*—
Van Devanter, Douglas E.; Moore, Kelly R.; and Tomlin, James S., 4,557,019, Cl. 17-52.000.

Tomosada, Masahiro, to Canon Kabushiki Kaisha. Image forming apparatus having a cleaning member. 4,557,588, Cl. 355-14.00R.

Tong, Jerry E.: *See*—
Olson, Donald M.; Jackson, Norman L.; and Tong, Jerry E., 4,557,657, Cl. 414-180.000.

Tong, Yulan C., to Dow Chemical Company, The. Certain phenoxypyridine-carbonitriles having antiviral activity. 4,558,134, Cl. 514-344.000.

Topping, Terry M.: *See*—
Fischer, Robert L.; Pulcrano, Frank C.; Coldiron, Lee C.; Topping, Terry M.; Potter, J. H.; and Owens, Robert H., 4,557,661, Cl. 414-730.000.

Toray Industries, Inc.: *See*—
Kurihara, Masaru; Watanabe, Tetsuo; and Inoue, Tetsuo, 4,557,949, Cl. 427-244.000.
Matsumoto, Tadayuki; Imaeda, Kozo; Mineo, Masatoshi; and Nakagawa, Kiyoshi, 4,557,026, Cl. 28-258.000.
Okamoto, Miyoshi; Iijima, Hiromichi; and Miyoshi, Akito, 4,557,972, Cl. 428-373.000.

Toray Silicone Company, Ltd.: *See*—
Ona, Isao; Ozaki, Masaru; and Usui, Katsutoshi, 4,557,887, Cl. 264-216.000.

Torbus, Marek, to Huttenes-Albertus Chemische Werke GmbH. Mould material binding agent system which cold-hardens with formation of polyurethane. 4,558,074, Cl. 523-142.000.

Torii, Nobutoshi: *See*—
Nakashima, Seiichiro; Torii, Nobutoshi; and Hamura, Masayuki, 4,557,660, Cl. 414-730.000.

Torikata, Akio: *See*—
Haneishi, Tatsuo; Okazaki, Takao; Torikata, Akio; Nakajima, Mutsuo; Enokita, Ryuzou; Katayama, Toshiaki; and Iwado, Seigo, 4,557,933, Cl. 424-118.000.
Torimoto, Koichi, to Mitsubishi Denki Kabushiki Kaisha. Combustion apparatus for vehicle. 4,557,108, Cl. 60-286.000.
Toshiba Components Co.: *See*—
Takada, Junji; Minamitake, Masayuki; and Tamegai, Satoshi, 4,558,226, Cl. 250-551.000.
Toshiba Kikai Kabushiki Kaisha: *See*—
Hashimoto, Yutaka, 4,557,291, Cl. 137-596.130.
Sasaki, Tamotsu; and Tsuchiya, Yutaka, 4,558,266, Cl. 318-571.000.
Tourle, Peter: *See*—
Ball, Cyril T.; Tourle, Peter; and Wright, Robert L., 4,558,257, Cl. 315-5.380.
Towmotor Corporation: *See*—
Pickering, William, 4,557,343, Cl. 180-142.000.
Wiblin, Wayne T., 4,558,194, Cl. 200-61.890.
Toyama, Kunio: *See*—
Yamashita, Izumi; and Toyama, Kunio, 4,558,119, Cl. 528-215.000.
Toyama, Tatsuro; and Fujiwara, Masayuki, to Nippon Chemi-Con Corporation; and Hitachi Limited. Electrolytic capacitor and a process for producing the same. 4,558,399, Cl. 361-433.000.
Toyo Rubber Industry Co., Ltd., The: *See*—
Kan, Masanori; Okazaki, Takuya; and Sakashita, Tatsuo, 4,558,088, Cl. 524-505.000.
Toyo Seikan Kaisha, Ltd.: *See*—
Yamanashi, Shigeaki, 4,557,397, Cl. 220-270.000.
Toyo Shokuhin Kikai Kabushiki Kaisha: *See*—
Yamanashi, Yoshihiro; Okuma, Minoru; Hata, Masahito; and Nishihara, Toshio, 4,557,711, Cl. 474-900.000.
Toyohara, Kenichi: *See*—
Imai, Tetsuya; Toyohara, Kenichi; Goto, Takeshi; Murata, Tadateru; Ando, Akihide; Uchida, Toshiro; and Yamamoto, Izuru, 4,557,750, Cl. 71-87.000.
Toyota Jidosha Kabushiki Kaisha: *See*—
Ito, Toshimitsu, 4,557,234, Cl. 123-339.000.
Motonami, Masanao; Yamada, Makoto; and Ogawa, Hisashi, 4,557,523, Cl. 297-468.000.
Sakakibara, Shigemi, 4,557,354, Cl. 188-73.450.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Akiyama, Susumu; Ito, Kenzo; Fukaya, Hiroyasu; Ogiso, Haruhiko; Hirabayashi, Yuji; and Kawamura, Takahide, 4,558,417, Cl. 364-431.110.
Tozuka, Zenzaburo: *See*—
Takaya, Takao; and Tozuka, Zenzaburo, 4,558,047, Cl. 514-229.000.
Tractech, Inc.: *See*—
Dissett, Walter L.; and Bawks, James R., 4,557,158, Cl. 74-650.000.
Trimnell, Lawrence J.: *See*—
Kennedy, James C.; Trimnell, Lawrence J.; and Zola, Meyer J., 4,558,444, Cl. 370-58.000.
Tripp, Dale S.; and Kunkle, Timothy E., to White Consolidated Industries, Inc. Erosion resistant soft seated valve trim. 4,557,463, Cl. 251-210.000.
Triten Corporation: *See*—
Baumgartner, Gary J.; Walter, Carl E.; and Post, Arthur J., Jr., 4,557,804, Cl. 202-227.000.
Trofimenkoff Engineering, Ltd.: *See*—
Trofimenkoff, Frederick N.; Bhagwan, Jai; and Poscente, Sandro P., 4,558,301, Cl. 340-347.0AD.
Trofimenkoff, Frederick N.; Bhagwan, Jai; and Poscente, Sandro P., to Trofimenkoff Engineering, Ltd.; Bhagwan, Jai; Poscente, Sandro; and University of Calgary, Governors of the. Voltage-to-frequency and analog-to-digital converter circuit. 4,558,301, Cl. 340-347.0AD.
Trube & Kings KG: *See*—
Breithaupt, Albert, 4,557,089, Cl. 52-235.000.
Trumbo, Andrew L.: *See*—
Childers, Roger K.; Buchanan, Kenneth L.; and Trumbo, Andrew L., 4,557,282, Cl. 133-3.00A.
TRW Inc.: *See*—
Drutchas, Gilbert H., 4,557,342, Cl. 180-132.000.
Tschappat, Robert W., Jr., to United Banks of Colorado, Inc. Apparatus and method for drive-up banking. 4,557,352, Cl. 186-37.000.
Tsuchiya, Tadashi: *See*—
Kawasaki, Takao; Immaru, Daisaku; Tsuchiya, Tadashi; Yamaguchi, Yukiharu; and Komatsu, Katsumi, 4,558,059, Cl. 514-371.000.
Tsuchiya, Takeshi; Samejima, Shuji; and Kimura, Tsutomu, to Nippon Piston Ring Co., Ltd. Nitrided piston ring with outer layer on surface. 4,557,492, Cl. 277-216.000.
Tsuchiya, Yutaka: *See*—
Sasaki, Tamotsu; and Tsuchiya, Yutaka, 4,558,266, Cl. 318-571.000.
Tsukahara, Hiroaki: *See*—
Amemori, Koichi; Takahashi, Yosuke; Miyazaki, Manabu; Tsukahara, Hiroaki; Kawabe, Toshihiko; and Banba, Toshio, 4,557,235, Cl. 123-367.000.
Tsukuda, Hitoshi; and Sakanoue, Akira, to Central Glass Company Limited. Graphite fluoride coated with organic polymer and method of preparing same. 4,557,974, Cl. 428-407.000.
Tsumiyama, Hisanori: *See*—
Takanashi, Itsuo; Tanaka, Hideshi; Tsumiyama, Hisanori; Mizuno, Yoshio; Ohara, Teruni; Kato, Shigeru; Takahasi, Toshinori; and Kiuchi, Tsutomu, 4,558,328, Cl. 346-76.0PH.
Tsuneki, Hideaki; Ueshima, Michio; Aoki, Ryuji; and Nagai, Isao, to Nippon Shokubai Kagaku Kogyo Co., Ltd. Catalyst for production of methacrylic acid. 4,558,028, Cl. 502-211.000.
Tsuno, Koichi: *See*—
Ono, Kimizo; and Tsuno, Koichi, 4,557,598, Cl. 356-241.000.
Tsuzurabara, Mamoru, to Hitachi, Ltd. Cathode structure of electron tube. 4,558,250, Cl. 313-337.000.
Tubbs, Paul; and King, James, to Pennwalt Corporation. Synergistic lubricant additives of antimony thioantimonate and molybdenum disulfide or graphite. 4,557,839, Cl. 252-23.000.
Tuftco Corporation: *See*—
Watkins, Charles W., 4,557,209, Cl. 112-266.200.
Turner, George R.: *See*—
Cherry, Sidney J.; and Turner, George R., 4,557,529, Cl. 308-4.00R.
Turner, Stephen K.: *See*—
Wright, Alan J.; O'Hara, Kevin J.; and Turner, Stephen K., 4,558,076, Cl. 523-442.000.
Turner, Vernon S.; and Melton, Randall, to Melco Industries, Inc. Method and apparatus for improved automatic stitching. 4,557,207, Cl. 112-266.100.
Turney, Robert A.: *See*—
LeBlanc, Aladain J.; and Turney, Robert A., 4,558,219, Cl. 250-260.000.
Tusso, Robert J.: *See*—
Plasencia, Armand J.; Tusso, Robert J.; and Gilson, Alan P., 4,558,373, Cl. 358-285.000.
Tuthill, Michael G.; and Minogue, Paschal, to Analog Devices, Incorporated. Extended reference range, voltage-mode CMOS D/A converter. 4,558,242, Cl. 307-577.000.
Tuti, Peter: *See*—
Bencz, Gyozo ; Deres, Janos; and Tuti, Peter, 4,557,771, Cl. 149-14.000.
Tuttle, Alan H.; Leonard, James K.; Agharkar, Shireesh A.; and Waggott, John, to Dresser Industries, Inc. Control of steam turbine shaft thrust loads. 4,557,664, Cl. 415-105.000.
Twilley, Ian C.: *See*—
Lofquist, Robert A.; Twilley, Ian C.; and Saunders, Peter R., 4,558,097, Cl. 525-183.000.
Tybring, Leif, to Leo Pharmaceutical Products Ltd. Antibacterial synergistic pharmaceutical compositions. 4,557,932, Cl. 424-114.000.
Tysoe, Nicholas W., to Britax Vega Limited. Vehicle lamp assembly. 4,558,401, Cl. 362-290.000.
Tysoe, Nicholas W., to Britax Vega Limited. Vehicle lamp assembly. 4,558,402, Cl. 362-293.000.
UBE Industries, Ltd.: *See*—
Nakano, Tsunetomo; Yasuno, Hiroshi; and Nishio, Kazuaki, 4,558,117, Cl. 528-184.000.
Uchida, Toshiro: *See*—
Imai, Tetsuya; Toyohara, Kenichi; Goto, Takeshi; Murata, Tadateru; Ando, Akihide; Uchida, Toshiro; and Yamamoto, Izuru, 4,557,750, Cl. 71-87.000.
Uchikawa, Naoshi: *See*—
Murayama, Akira; Kuno, Hiroaki; Uchikawa, Naoshi; Tamura, Takahiro; Mizuno, Takao; Kotani, Sumihisa; Tomita, Yoshikatsu; Arata, Tetsuya; Shiibayashi, Masao; and Suefuji, Kazutaka, 4,557,675, Cl. 418-55.000.
Ueda, Morimasa, to Mitutoyo Mfg. Co., Ltd. Edge detector in optical measuring instrument. 4,557,602, Cl. 356-372.000.
Uekita, Masakazu; Fushiki, Yasuo; and Ooizumi, Masayuki, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Continuous process for producing a metal clad laminate. 4,557,784, Cl. 156-307.700.
Ueno, Hideo, to Brother Kogyo Kabushiki Kaisha. Electronic typewriter with automatic power-off device. 4,557,615, Cl. 400-54.000.
Ueno, Makoto: *See*—
Shinohara, Masaru; Ueno, Makoto; and Sakata, Tsunetaka, 4,558,369, Cl. 358-257.000.
Ueshima, Michio: *See*—
Tsuneki, Hideaki; Ueshima, Michio; Aoki, Ryuji; and Nagai, Isao, 4,558,028, Cl. 502-211.000.
Uhrig, Dieter: *See*—
Rodi, Anton; Blasius, Udo; and Uhrig, Dieter, 4,558,216, Cl. 250-223.00R.
Uittenbogaard, Maurice: *See*—
Meek, Jan; Uittenbogaard, Maurice; Michelsen, Finn C.; and Heerema, Pieter S., deceased, 4,557,629, Cl. 405-204.000.
Ulbing, Otmar M., to Air Monitor Corporation. Harmonic screw actuator. 4,557,153, Cl. 74-2.000.
Ullmann, Werner; Bantle, Max; Neumann, Harry; Seuser, Ulrich H.; and Mathys, Andre, to Ullmann, Werner. Apparatus for shaping an electrode of a prescribe spatial configuration by means of an abrading die. 4,557,075, Cl. 51-58.000.
Ulveling, Leon: *See*—
Mailliet, Pierre; Ulveling, Leon; and Metz, Jean, 4,557,468, Cl. 266-273.000.
Umeda, Hiroyuki, to Victor Company of Japan, Ltd. Miniature type tape cassette and adapter means. 4,558,384, Cl. 360-94.000.
Umehara, Akira: *See*—
Iwasaki, Masayuki; and Umehara, Akira, 4,557,997, Cl. 430-325.000.
Union Camp Corporation: *See*—
Robinson, William M., 4,557,385, Cl. 206-620.000.
Union Carbide Corporation: *See*—
Barth, Bruce P.; and Mallon, Charles B., 4,558,095, Cl. 525-57.000.
Brod, William B.; Coppala, George H.; and Olds, Delbert L., 4,557,904, Cl. 422-146.000.
Kanner, Bernard; Quirk, Jennifer M.; De Monte, Arthur P.; and Mehta, Kunj R., 4,558,146, Cl. 556-410.000.
Kawakami, James H.; and Maresca, Louis M., 4,558,106, Cl. 526-216.000.

Pike, Reginald A., 4,557,735, Cl. 55-26.000.
Savich, Peter P., 4,557,713, Cl. 493-194.000.
Union Oil Company of California: *See—*
Holstedt, Richard A.; and Jessup, Peter J., 4,557,843, Cl. 252-46.400.
Unisearch Limited: *See—*
Ruck, Nancy C.; Mills, David R.; and Harting, Erik, 4,557,565, Cl. 350-262.000.
United Banks of Colorado, Inc.: *See—*
Tschappat, Robert W., Jr., 4,557,352, Cl. 186-37.000.
United Kingdom Atomic Energy Authority: *See—*
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United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See—*
Hickey, Dennis J., 4,557,198, Cl. 102-481.000.
United States Gypsum Company: *See—*
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Air Force: *See—*
Clapp, Roger E., 4,558,324, Cl. 343-754.000.
Kuperman, Gilbert G.; and Wallquist, Donald L., 4,558,359, Cl. 358-89.000.
Lee, Joseph C., 4,558,290, Cl. 333-126.000.
McDermott, William E.; Ellis, David E.; Pchelkin, Nicholas R.; Miller, George W.; Benard, David J.; and Richardson, Ralph J., 4,558,451, Cl. 372-89.000.
Novick, Leonard R., 4,558,445, Cl. 370-84.000.
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United States of America as represented by the Secretary of Agriculture, The: *See—*
Schwab, Arthur W.; and Pryde, Everett H., 4,557,734, Cl. 44-53.000.
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Energy: *See—*
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Mikulas, Martin M., Jr.; and Crawford, Robert F., 4,557,097, Cl. 52-646.000.
National Aeronautics & Space Administration: *See—*
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Navy: *See—*
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McLandrich, Matthew N., 4,557,553, Cl. 350-96.150.
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U.S. Philips Corporation: *See—*
Bergmans, Hendrik J., 4,558,381, Cl. 360-77.000.
deFoorter, Johannes A.; deWaard, Peter J.; Tijburg, Rudolf P.; and Dinghs, Gerardus L., 4,558,448, Cl. 372-44.000.
Geurts, Jan V. M., 4,557,536, Cl. 339-8.00P.
Strom, Johan P., 4,558,325, Cl. 343-765.000.
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van Rosmalen, Gerard E., 4,557,564, Cl. 350-247.000.
United States Surgical Corporation: *See—*
Green, David T., 4,557,263, Cl. 128-325.000.
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Lillibridge, Herbert J.; and Schwarzmann, Russell A., 4,557,412, Cl. 228-155.000.
University of Calgary, Governors of the: *See—*
Trofimenkoff, Frederick N.; Bhagwan, Jai; and Poscente, Sandro P., 4,558,301, Cl. 340-347.0AD.
University of California, The Regents of the: *See—*
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Irie, Reiko F.; Tai, Tadashi; Morton, Donald L.; Cahan, Leslie D.; and Paulson, James C., 4,557,931, Cl. 424-88.000.
University of Cincinnati: *See—*
Ackerman, Jerome L.; Clark, Leland C., Jr.; and Thomas, Stephen R., 4,558,279, Cl. 324-315.000.
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University of Kentucky, The Board of Trustees of the: *See—*
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University Patents, Inc.: *See—*
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Urata, Shinji; Hirobe, Hitoshi; and Iketani, Kohei, to Asahi Kogaku Kogyo Kabushiki Kaisha. Automatic focusing device for video camera. 4,558,367, Cl. 358-227.000.
Urbach, Hansjorg; Henning, Rainer; and Becker, Reinhard, to Hoechst Aktiengesellschaft. Derivatives of tricyclic aminoacids, processes for their preparation, agents containing these compounds and their use, and new bicyclic aminoacids as intermediates and processes for their preparation. 4,558,065, Cl. 514-412.000.
Urbach, Hansjorg: *See—*
Teetz, Volker; Urbach, Hansjorg; and Becker, Reinhard, 4,558,064, Cl. 514-409.000.
Urban, Virginia L.: *See—*
Greene, Donald F.; and Urban, Virginia L., 4,557,898, Cl. 422-28.000.
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Usami, Hayato: *See—*
Kida, Susumu; Usami, Hayato; and Aoki, Hideji, 4,558,346, Cl. 357-74.000.
Ushijima, Tadayoshi: *See—*
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Ushiroyama, Nobuyasu: *See—*
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USM Corporation: *See—*
Mansfield, Graham J.; Hall, Dennis S.; and Cameron, Ewen R., 4,557,787, Cl. 156-356.000.
Meeker, Gregory W.; and Bleck, Norris E., 4,557,683, Cl. 425-147.000.
Morse, Albert I., 4,557,402, Cl. 222-230.000.
Usner, Daniel C. Multiple garment hanger transfer device. 4,557,516, Cl. 294-143.000.
Usui, Katsutoshi: *See—*
Ona, Isao; Ozaki, Masaru; and Usui, Katsutoshi, 4,557,887, Cl. 264-216.000.
USV Pharmaceutical Corp.: *See—*
Skiles, Jerry W.; Youssefyeh, Raymond D.; Suh, John T.; and Jones, Howard, 4,558,038, Cl. 514-20.000.
Utsunomiya, Mitito, to Kabushiki Kaisha Ishida Koki Seisakusho. Load cell. 4,557,150, Cl. 73-862.650.
Vahlberg, Christer; and Hielm, Odd. Anti-theft device for outboard motors. 4,557,458, Cl. 248-553.000.
Valeas S.p.A.: *See—*
Bernareggi, Virgilio; Bonifacio, Fausto; Margutti, Roberto; and Fano, Maurizio, 4,558,054, Cl. 514-291.000.
Valentin, Jean P., to Etat Francais. Temperature-compensated quartz oscillator. 4,558,248, Cl. 310-315.000.
Valyocsik, Ernest W.; and Derouane, Eric G., to Mobil Oil Corporation. Synthesis of zeolite ZSM-5 with anionic organic compounds. 4,557,917, Cl. 423-328.000.
Van Benschoten, Peter J., to Micromanipulator Microscope Company, Inc., The. Guide rail apparatus for positioning flat objects for microscopic examination. 4,557,568, Cl. 350-531.000.
Van Cangh, Luc: *See—*
Claes, Paul; Dauby, Christian; Dupont, Camille; and Van Cangh, Luc, 4,557,743, Cl. 65-29.000.
Vanderjagt, John A. Pumping apparatus. 4,557,669, Cl. 417-271.000.
Vandesteeg, Gregg A.: *See—*
Ronning, Patricia M.; and Vandesteeg, Gregg A., 4,557,751, Cl. 71-91.000.
Van Devanter, Douglas E.; Moore, Kelly R.; and Tomlin, James S., to Seafreeze Limited Partnership. Automatic portion-cutting method and machine. 4,557,019, Cl. 17-52.000.
Van Dewoestine, Robert V.: *See—*
Blanding, Wendell S.; Johnson, Ronald E.; and Van Dewoestine, Robert V., 4,557,798, Cl. 156-660.000.
Van Dokkum, Jan: *See—*
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Van Pelt, Wilhelmus H. J. M., to Grasso's Koniklyke Machine Fabriekon N.V. Gradient column freeze concentration system. 4,557,741, Cl. 62-541.000.
van Rosmalen, Gerard E., to U.S. Philips Corporation. Movable scanning unit for an optical recording or playback apparatus. 4,557,564, Cl. 350-247.000.
Varall, Alfred J., Jr.: *See—*
Jatkar, Arun D.; Varall, Alfred J., Jr.; and Schelleng, Robert D., 4,557,893, Cl. 419-12.000.
Varian Associates, Inc.: *See—*
Graves, Walter E., Jr., 4,558,388, Cl. 360-135.000.
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Sauer, Hans, 4,557,983, Cl. 429-27.000.
Voss, Ernst, 4,557,985, Cl. 429-191.000.
Vasicek, Vladimir: *See—*
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Vasilieva, Ljubov S.: *See—*
Emanuel, Nikolai M.; Rozenberg, Albina N.; Golubev, Valery A.; Bogdanov, Gennady N.; Vasilieva, Ljubov S.; and Konovalova, Nina P., 4,558,127, Cl. 544-310.000.
Vaubel, Gert; and Beier, Heinz, to Benteler-Werke Aktiengesellschaft. Adjustable continuous casting mold arrangement. 4,557,315, Cl. 164-420.000.
Vazopolos, Steve: *See—*
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Vearil, Wayne L.: *See—*
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Venaleck, John T.: *See—*
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Verbanac, Frank, to A. E. Staley Manufacturing Company. Cellulosic organic solvent soluble products. 4,557,951, Cl. 527-312.000.
Verbatim Corporation: *See—*
Gephart, Russell L., 4,557,604, Cl. 356-432.000.
Verboom, Pieter, to IHC Holland N.V. Apparatus for removing oil from water. 4,557,832, Cl. 210-242.300.
Vereinigte Flugtechnische Werke GmbH: *See—*
Koch, Eckhard; Vogg, Gunter; and Soller, Jochen, 4,557,648, Cl. 410-78.000.
Vernon, Caroline L.; and Stanek, Earl A., to Minnesota Mining and Manufacturing Co. Pressure sensitive adhesive transfer tape containing organic filaments. 4,557,960, Cl. 428-40.000.
Vernon, John S.: *See—*
Bangay, Alan J.; Cole, Adrian; and Vernon, John S., 4,557,894, Cl. 419-67.000.
Verosol USA Inc.: *See—*
Judkins, Ren S., 4,557,309, Cl. 160-84.00R.
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Falknor, Charles L.; Vetter, Vincent H.; Wolfer, Dale R.; and Lyon, Dalton K., 4,557,339, Cl. 175-325.000.
Vezzani, Luciano, to Officine Vezzani S.p.A. Apparatus for compacting scrap materials, such as relatively comminuted scrap metal, waste, and the like. 4,557,190, Cl. 100-98.00R.
Victor Company of Japan, Ltd.: *See—*
Hirota, Akira, 4,558,353, Cl. 358-36.000.
Iizuka, Jiro; Kaneko, Takatoshi; and Hashiba, Tooru, 4,558,330, Cl. 346-76.0PH.
Sugiyama, Hiroyuki, 4,558,362, Cl. 358-138.000.
Takanashi, Itsuo; Tanaka, Hideshi; Tsumiyama, Hisanori; Mizuno, Yoshio; Ohara, Terumi; Kato, Shigeru; Takahasi, Toshinori; and Kiuchi, Tsutomu, 4,558,328, Cl. 346-76.0PH.
Umeda, Hiroyuki, 4,558,384, Cl. 360-94.000.
Yamada, Kazuo, 4,558,442, Cl. 369-126.000.
Vidal, Henri. Wall structure and method of construction. 4,557,634, Cl. 405-286.000.
Vidoz, Aldo E.; Crooks, Donald D.; Lewis, Richard E.; Palmer, Ian G.; and Wadsworth, Jeffrey, to Lockheed Missiles & Space Company, Inc. Aluminum base alloys. 4,557,770, Cl. 148-437.000.
Vieth, Friedhelm: *See—*
Klose, Sigmar; Pasch, Manfred; Kleemann, Wolfgang; Vieth, Friedhelm; and Buschek, Herbert, 4,557,600, Cl. 356-246.000.
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Violett, Robert S.; and Andersen, W. Lee. Power plant for model jet aircraft. 4,557,107, Cl. 60-269.000.
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Vock, Manfred H.: *See—*
Pittet, Alan O.; Muralidhara, Ranya; and Vock, Manfred H., 4,557,941, Cl. 426-535.000.
Voegel, Robert L.; and Wright, Kenton B., to Aluminum Company of America. Reduced voltage electrode design. 4,557,817, Cl. 204-286.000.
Voelker, Heinz: *See—*
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Voest-Alpine Aktiengesellschaft: *See—*
Krennayr, Franz; Lichtenegger, Franz; and Goschl, Peter, 4,557,833, Cl. 210-386.000.
Vogg, Gunter: *See—*
Koch, Eckhard; Vogg, Gunter; and Soller, Jochen, 4,557,648, Cl. 410-78.000.
Vogt, Norman H., to Sevald, William T. Method and apparatus for processing similar workpieces of varying shape, points of contour and dimension. 4,557,014, Cl. 17-1.00R.
Vogt, Wilhelm: *See—*
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Volk, Russell D., to Denice C. Reich Inc. Lubrication system for a walking beam compressor. 4,557,351, Cl. 184-18.000.
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Volkswagenwerk Aktiengesellschaft: *See—*
Neumann, Joachim; Pickert, Detlef; and Emmenthal, Klaus-Dieter, 4,557,874, Cl. 261-19.000.
Volpert, Fritz; and Stocker, Hans-Werner, to Luwa AG. Deformable container with filler unit. 4,557,956, Cl. 428-35.000.
von dem Bussche, Glenn T.: *See—*
Nichols, James D.; Derby, Richard; von dem Bussche, Glenn T.; and Hannum, David A., 4,557,838, Cl. 252-8.55C.
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von Laufenberg, Jurgen: *See—*
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von Resch, Julius M., to Gretsch-Unitas GmbH. Ventilator apparatus. 4,557,321, Cl. 165-122.000.
Voss, Ernst, to Varta Batterie Aktiengesellschaft. Polyacetylene cell with ceramic solid electrolyte. 4,557,985, Cl. 429-191.000.
Vyalykh, Vladimir I.: *See—*
Kontar, Evgeny A.; Soloviev, Sergei L.; Brovko, Viktor P.; Glukhikh, Rudolf G.; Khomyakov, Evgeny N.; Pakhomov, Jury F.; Khmeljuk, Alexei M.; Vyalykh, Vladimir I.; Zansokhov, Leonid G.; Smertin, Valentin P.; Evseev, Alexei I.; and Sharipov, Fyarit A., 4,557,697, Cl. 441-2.000.
W. L. Gore & Associates, Inc.: *See—*
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W. R. Grace & Co.: *See—*
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W. Schlafhorst & Co.: *See—*
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W. Vinten Limited: *See—*
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W. W. Sly Manufacturing Co., The: *See—*
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Wada, Hirotsugu: *See—*
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Wagener Schwelm GmbH & Co.: *See—*
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Wagensonner, Eduard; Ruf, Wolfgang; and Landsiedel, Thomas, to Agfa-Gevaert AG. Arrangement of a dynamic random access memory. 4,558,436, Cl. 365-230.000.
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Wagner, Alfred; and Ames, Adolf, to Swiss Aluminium Ltd. Device for indirect extrusion of a hollow section. 4,557,131, Cl. 72-273.000.
Wagner, Hans: *See—*
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Waite, Phillip: *See—*
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Wakalopulos, George; Hill, Robert A.; and Peressini, Eugene R. Cathode bleed arrangement for electrically excited flowing gas lasers. 4,558,450, Cl. 372-87.000.
Wakatake, Yoshimasa. Rotating display element and display unit using the same. 4,558,267, Cl. 318-696.000.
Walch, Axel; Seifried, Walter; Michel, Wolfgang; Kuhls, Jurgen; and Wildhardt, Jurgen, to Hoechst Aktiengesellschaft. Shaped articles which are composed of a copolymer containing fluorine groups and which are selectively permeable to liquids and gases and are simultaneously oleophobic and oleophilic. 4,557,955, Cl. 428-35.000.
Waldman, Donald J.: *See—*
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Walker, Floyd E. Snow plowable pavement marker. 4,557,624, Cl. 404-14.000.
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Walker, Stephen J., to Cameron Iron Works, Inc. Tubular connector. 4,557,508, Cl. 285-84.000.
Wallace, Robert S., to Wallace, Robert S.; and Bauman, Jack, a part interest. Heart valve. 4,556,996, Cl. 623-2.000.
Wallentin, Bengt: *See*—
Forsgren, Roland; Garpendahl, Gunnar; Eriksson, Hans; and Wallentin, Bengt, 4,558,311, Cl. 340-680.000.
Wallquist, Donald L.: *See*—
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Walt Disney Productions: *See*—
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Walter, Carl E.: *See*—
Baumgartner, Gary J.; Walter, Carl E.; and Post, Arthur J., Jr., 4,557,804, Cl. 202-227.000.
Walworth, Robert S.; Hinshaw, Jay; and LaBotz, Arnold H., to American Seating Company. Automatic seating for telescoping row systems. 4,557,080, Cl. 52-9.000.
Wand, Martin A., to Texas Instruments Incorporated. Incremental encoder synchronous decode circuit. 4,558,304, Cl. 340-347.0SY.
Wang, Jung-Hwa. Folding chair capable of converting into step ladder. 4,557,350, Cl. 182-33.000.
Wang, Ke-Chin: *See*—
Petrak, Daniel R.; Winkelbauer, Howard M.; Kleeb, Thomas R.; and Wang, Ke-Chin, 4,557,884, Cl. 264-65.000.
Ward, Denis S.: *See*—
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Ward, Joseph W.; Povio, Raymond A.; Schroeder, Russell G.; and Chan, Patrick S., to Xerox Corporation. Capacitive discharge drive for electric stapler. 4,558,391, Cl. 361-155.000.
Waris, Veikko K. T., to A. Ahlstrom Osakeyhtio. Apparatus for affecting a web drained on a wire. 4,557,802, Cl. 162-264.000.
Warner, Donald F., to Heat Exchanger Industries, Inc. Exhaust gas treatment method and apparatus. 4,557,202, Cl. 110-216.000.
Washburn, William N.; and Hollister, Kenneth R., to Eastman Kodak Company. Colorless ligand-releasing monomers and polymers and their use to provide dyes with metal ions. 4,557,998, Cl. 430-367.000.
Washington University: *See*—
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Watanabe, Masanori: *See*—
Tanaka, Junichi; Furubayashi, Hisatoshi; Watanabe, Masanori; and Hijikigawa, Masaya, 4,558,393, Cl. 361-286.000.
Watanabe, Masazumi: *See*—
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Waterbury, L. David, to Syntex (U.S.A.) Inc. Treatment and prevention of ocular hypertension. 4,558,066, Cl. 514-422.000.
Watermann, Willy; and Hachenberg, Winfried, to Klockner-Becorit GmbH. Shield-type support frame. 4,557,635, Cl. 405-296.000.
Waters, Donald D.: *See*—
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Watkins, Charles W., to Tuftco Corporation. Sculptured high-low cut pile tufting method and apparatus. 4,557,209, Cl. 112-266.200.
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Watson, James M.; and Bailey, Darrell E., to Cosden Technology, Inc. Process for the production of vinyltoluene. 4,558,169, Cl. 585-440.000.
Wcislo, Manfred; Breitenbach, Otto; Schatz, Friedrich; and Riepling, Ulrich, to Kabelmetal Electro GmbH; and Thyssen Industrie AG. Installing a prefabricated winding of a linear motor. 4,557,038, Cl. 29-596.000.
Weaver, William N.; and Olsen, Robert C., to Illinois Tool Works Inc. Multi-packaging device. 4,557,375, Cl. 206-151.000.
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Kehrbach, Wolfgang; and Wegener, Joachim, 4,558,052, Cl. 514-279.000.
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Blais, Phillip D., 4,557,986, Cl. 430-22.000.
Cherry, Sidney J.; and Turner, George R., 4,557,529, Cl. 308-4.00R.
Csakvary, Tibor; Shum, Lanson Y.; and Miller, Bernard, 4,557,663, Cl. 414-751.000.
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Tripp, Dale S.; and Kunkle, Timothy E., 4,557,463, Cl. 251-210.000.
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Sabelstrom, Jan; and Wiholm, Sture, 4,557,714, Cl. 493-442.000.

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Kopatz, Heinz-Dieter, 4,557,155, Cl. 74-200.000.

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Wilson, John L. A.: *See*—
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Petrak, Daniel R.; Winkelbauer, Howard M.; Kleeb, Thomas R.; and Wang, Ke-Chin, 4,557,884, Cl. 264-65.000.

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Winnek, Douglas F. Method and apparatus for making true three-dimensional photographs from pseudo three-dimensional photographs. 4,557,590, Cl. 355-22.000.

Winter, Joseph, to Olin Corporation. Process for die forming a tubular member at a reduced drawing force. 4,557,559, Cl. 350-96.230.

Wisbey, Jerry D., to Cincinnati Milacron Inc. Tape laminator. 4,557,790, Cl. 156-511.000.

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Withiam, Michael C., to J. M. Huber Corporation. Synthetic calcium silicates and methods of preparation. 4,557,916, Cl. 423-328.000.

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Falknor, Charles L.; Vetter, Vincent H.; Wolfer, Dale R.; and Lyon, Dalton K., 4,557,339, Cl. 175-325.000.

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Coffen, David L.; Holland, George W.; Mandeville, W. Harry; Rosen, Perry; and Wong, Frederick, 4,558,140, Cl. 349-312.000.

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Read, Owen R., 4,557,515, Cl. 294-67.220.

Woodstream Corporation: *See*—
Thomas, Gerald A.; and Askins, William E., 4,557,068, Cl. 43-90.000.

Woolley, Warren H.; Lama, William L.; Rees, James D.; and Durbin, John A., to Xerox Corporation. Full-frame short focal length imaging system. 4,557,581, Cl. 355-1.000.

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Joppig, Peter; Peitz, Bernard; and Woschee, Dieter, 4,557,233, Cl. 123-323.000.

Wright, Alan J.; O'Hara, Kevin J.; and Turner, Stephen K., to Coates Brothers PLC. Coating compositions. 4,558,076, Cl. 523-442.000.

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Goodridge, Francis; Plimley, Raymond E.; and Wright, Allen R., 4,557,812, Cl. 204-130.000.

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Voegel, Robert L.; and Wright, Kenton B., 4,557,817, Cl. 204-286.000.

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Wu, Kent K., to Henry Ford Hospital. Surgical method and apparatus for inserting wire into the spine. 4,557,259, Cl. 128-92.00E.

Wyatt, Tim A., to Leem Company, Inc. Potato cooker for microwave ovens. 4,558,197, Cl. 219-10.55E.

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Arndt, George, 4,557,841, Cl. 252-32.70E.

Wysong, Robert D., to Du Pont de Nemours, E. I., and Company. Slow release pesticide formulations. 4,557,929, Cl. 424-78.000.

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Alexandru, Lupu; and Odell, Peter G., 4,558,108, Cl. 526-340.000.
Badesha, Santokh S.; and Fekete, George T., 4,557,922, Cl. 423-510.000.
Branston, Randoiph E.; and Duff, James M., 4,557,989, Cl. 430-59.000.
Donnelly, Thomas L.; and Pavlovych, Orest, 4,557,584, Cl. 355-3.0DD.
Genovese, Frank C.; and Pollack, Joel M., 4,558,255, Cl. 313-497.000.
Gundlach, Robert W.; and Bergen, Richard F., 4,558,221, Cl. 250-325.000.
Matyjakowski, David J., 4,557,993, Cl. 430-131.000.
Page, Geoffrey A.; Tokoli, Emery G.; Cosgrove, Robert T.; and Spiewak, John W., 4,557,868, Cl. 260-245.890.
Schmidt, Eric E.; and Lampson, Butler W., 4,558,413, Cl. 364-300.000.
Sprague, Robert A., 4,557,563, Cl. 350-162.120.
Stock, Robert A.; and Hayskar, Robert A., 4,557,786, Cl. 156-350.000.
Ward, Joseph W.; Povio, Raymond A.; Schroeder, Russell G.; and Chan, Patrick S., 4,558,391, Cl. 361-155.000.
Woolley, Warren H.; Lama, William L.; Rees, James D.; and Durbin, John A., 4,557,581, Cl. 355-1.000.

Yabe, Masao: *See*—
Yamamoto, Nobuyuki; Yabe, Masao; Nishikawa, Yasuo; Yanai, Akio; Shirahata, Ryuji; and Naruo, Kyoichi, 4,557,948, Cl. 427-131.000.

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Yamada, Jun, to Hitachi, Ltd. Surface acoustic wave device. 4,558,364, Cl. 358-188.000.

Yamada, Kazuji; Sato, Hideo; Kitadate, Yukitaka; Kawakami, Kanji; Kato, Kazuo; and Sasayama, Takao, to Hitachi, Ltd. Pressure transducer using integrated circuit elements. 4,558,238, Cl. 307-491.000.

Yamada, Kazuo, to Victor Company of Japan, Limited. Detector circuit for capacitance disc records. 4,558,442, Cl. 369-126.000.

Yamada, Makoto: *See*—
Motonami, Masanao; Yamada, Makoto; and Ogawa, Hisashi, 4,557,523, Cl. 297-468.000.

Yamada, Minoru; Masaki, Akira; Yamamoto, Masakazu; Nakanishi, Keiichirou; Nishida, Takashi; Daikoku, Takahiro; Kobayashi, Fumiyuki; and Imai, Kuninori, to Hitachi, Ltd. Cooling module for integrated circuit chips. 4,558,395, Cl. 361-385.000.

Yamada, Osamu; Murooka, Hideyasu; Ono, Kaoru; and Miyashita, Akimi, to Hitachi, Ltd. Hot press. 4,557,792, Cl. 156-583.100.

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Yamagata, Tetsuo: *See*—
Tanaka, Shuji; Nakamura, Shigehira; Sakamoto, Tuneaki; Hirakata, Yoshiaki; and Yamagata, Tetsuo, 4,558,460, Cl. 381-86.000.

Yamagiwa, Kazuo, to Sony Corporation. Circuit for generating a sum or differential frequency signal. 4,558,283, Cl. 328-160.000.

Yamaguchi, Tathuya, to Olympus Optical Co., Ltd. Endoscope. 4,557,254, Cl. 128-4.000.

Yamaguchi, Yukiharu: *See*—
Kawasaki, Takao; Immaru, Daisaku; Tsuchiya, Tadashi; Yamaguchi, Yukiharu; and Komatsu, Katsumi, 4,558,059, Cl. 514-371.000.

Yamakawa, Masahiro; Nakamura, Mamoru; and Arai, Toyoichi, to Nippon Zeon Co. Ltd. Vinyl chloride resin composition for production of hard articles. 4,558,087, Cl. 524-495.000.

Yamamoto, Etsuji; Sekihara, Kensuke; Kohno, Hideki; and Yamamoto, Shinji, to Hitachi, Ltd. NMR Imaging apparatus of changeable inspecting zone size. 4,558,425, Cl. 364-555.000.

Yamamoto, Hiroshi: *See*—
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Yamamoto, Izuru: *See*—
Imai, Tetsuya; Toyohara, Kenichi; Goto, Takeshi; Murata, Tadateru; Ando, Akihide; Uchida, Toshiro; and Yamamoto, Izuru, 4,557,750, Cl. 71-87.000.

Yamamoto Kagaku Co., Ltd.: *See*—
Yamamoto, Tamenobu, 4,556,995, Cl. 2-439.000.

Yamamoto, Masakazu: *See*—
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Yamamoto, Masanori: *See*—
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Yamamoto, Naoki: *See*—
Kishida, Kazuo; Yamamoto, Naoki; and Sato, Yasumasa, 4,558,099, Cl. 525-301.000.

Yamamoto, Nobuyuki; Yabe, Masao; Nishikawa, Yasuo; Yanai, Akio; Shirahata, Ryuji; and Naruo, Kyoichi, to Fuji Photo Film Co., Ltd. Process for producing magnetic recording materials. 4,557,948, Cl. 427-131.000.

Yamamoto, Sakuei; and Tokumitsu, Kiyonori, to Mitsubishi Denki Kabushiki Kaisha. Liquid-seal type motor having insulating oil pressure compensation. 4,558,247, Cl. 310-87.000.

Yamamoto, Shinji: *See*—
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Yamamoto, Soichiro: *See*—
Aotsuka, Yasuo; and Yamamoto, Soichiro, 4,558,002, Cl. 430-538.000.

Yamamoto, Tamenobu, to Yamamoto Kagaku Co., Ltd. Goggles for sports. 4,556,995, Cl. 2-439.000.

Yamamuro, Sigeaki: *See*—
Tanaka, Yoshikazu; Yamamuro, Sigeaki; Abo, Keiju; Hirano, Hiroyuki; Kumura, Haruyoshi; and Morimoto, Yoshiro, 4,557,706, Cl. 474-28.000.

Yamanaka, Minoru: *See*—
Haneda, Hideo; and Yamanaka, Minoru, 4,558,293, Cl. 335-255.000.

Yamanashi, Shigeaki, to Toyo Seikan Kaisha, Ltd. Pull tab for readily openable can lid. 4,557,397, Cl. 220-270.000.

Yamanashi, Yoshihiro; Okuma, Minoru; Hata, Masahito; and Nishihara, Toshio, to Toyo Shokuhin Kikai Kabushiki Kaisha. Phase control device. 4,557,711, Cl. 474-900.000.

Yamanoi, Kiyoshi: *See*—
Nakaso, Akishi; Okamura, Toshiro; Yamanoi, Kiyoshi; and Nakajima, Sumiko, 4,557,762, Cl. 106-1.230.

Yamanouchi Pharmaceutical Co., Ltd.: *See*—
Imai, Kazuo; Niigata, Kunihiro; Fujikura, Takashi; Hashimoto, Shinichi; and Takenaka, Toichi, 4,558,156, Cl. 564-85.000.

Yamasaki, Yasuo: *See*—
Sumitani, Koji; Sakai, Tokuji; Yamasaki, Yasuo; and Onodera, Tamio, 4,557,919, Cl. 423-329.000.

Yamashita, Izumi; and Toyama, Kunio, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for polymerization of 2,6-disubstituted phenol. 4,558,119, Cl. 528-215.000.

Yamashita, Keitaro, to Hitachi Metals, Ltd. Magnet roll and method of producing the same. 4,558,294, Cl. 335-303.000.

Yamatake-Honeywell Co., Ltd.: *See*—
Mogami, Takeo; and Saeki, Michio, 4,558,430, Cl. 364-900.000.

Yamato Scientific Co., Ltd.: *See*—
Orii, Ken; and Kawakami, Takao, 4,557,184, Cl. 98-115.300.

Yamazaki, Keiichirou. Fixing mechanism for stair units facilitating adjustment of height. 4,557,085, Cl. 52-182.000.

Yamazaki, Kisuke: *See*—
Hara, Masanori; Sugawara, Sakuo; Yamazaki, Kisuke; and Kasagi, Hiroshi, 4,557,247, Cl. 126-99.00R.

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Kanematsu, Hiroyuki; Nagae, Akimitsu; and Sano, Shinji, 4,558,419, Cl. 364-474.000.

Yanada, Sadao; Honda, Naganobu; Miyagaki, Hisanori; and Nigawara, Seiitsu, to Hitachi, Ltd. Method of controlling operation of thermoelectric power station. 4,558,227, Cl. 290-40.00R.

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Amemori, Koichi; Takahashi, Yosuke; Miyazaki, Manabu; Tsukahara, Hiroaki; Kawabe, Toshihiko; and Banba, Toshio, 4,557,235, Cl. 123-367.000.

Yardley, James T.: *See*—
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Yasuda, Hiroshi; and Marui, Kuniyoshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Wireless telephone apparatus including both a telephone handset and a telephone headset. 4,558,178, Cl. 179-2.00E.

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Kuroishi, Tadafumi; and Yasuda, Kazuo, 4,557,601, Cl. 356-320.000.

Yasui, Yoshiharu: *See*—
Morishita, Toshio; Yasui, Yoshiharu; Suzuki, Yoshihisa; Seiki, Kazuo; and Nakamura, Haruyoshi, 4,557,022, Cl. 19-267.000.

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Oguchi, Yukio; and Yasukawa, Kazuyoshi, 4,558,424, Cl. 364-513.000.

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Nakano, Tsunetomo; Yasuno, Hiroshi; and Nishio, Kazuaki, 4,558,117, Cl. 528-184.000.

Yates, Douglas A.: *See*—
Hanoka, Jack I.; Yates, Douglas A.; and Gregory, James A., 4,557,037, Cl. 29-576.00B.

Yellig, William F., Jr.: *See*—
Russell, Delbert D.; and Yellig, William F., Jr., 4,557,330, Cl. 166-274.000.

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Shriver, Ronald D., 4,558,421, Cl. 364-477.000.

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Akiyama, Chuji, 4,557,148, Cl. 73-861.280.

Yokomori, Shinji; and Ushijima, Yoshio, to Fuji Electric Company. Coin sorter. 4,557,366, Cl. 194-100.00A.

Yokota, Tsuneshi; and Nakagawa, Akira, to Tokyo Shibaura Denki Kabushiki Kaisha. Data recording and reproducing apparatus and method. 4,558,441, Cl. 369-59.000.

Yokoyama, Shigeki; Okamura, Hisashi; Maekawa, Yukio; and Kawasaki, Hiroshi, to Fuji Photo Film Co., Ltd. Silver halide photographic light-sensitive materials containing nonionic surface active antistatic agent. 4,558,001, Cl. 430-527.000.

Yokoyama, Yasumasa: *See*—
Kobayashi, Masatsune; Eida, Tsuyoshi; Koike, Shoji; Yokoyama, Yasumasa; and Komori, Tomoko, 4,557,761, Cl. 106-22.000.

Yokoyama, Yasuyuki; Hatano, Takayoshi; Suzuki, Kenji; and Fujioka, Koichiro, to Iwatsu Electric Co., Ltd. Exposure-scanning apparatus. 4,557,592, Cl. 355-51.000.

Yoneda, Akiyoshi, to Amada Company, Limited. Saw blade. 4,557,172, Cl. 83-848.000.

Yonemoto, Hiroshi; Narimatsu, Akihisa; and Suzuki, Nobuyuki, to Sony Magnescale Incorporated. Position detecting device. 4,558,312, Cl. 340-680.000.

Yonezawa, Keitaro, to Aioi Seiki K. K. Work-clamp pallet for machine tool. 4,557,371, Cl. 198-803.010.

Yong, Fui K. Electrical supervisory control and data acquisition system. 4,558,316, Cl. 340-825.060.

Yoshida Kogyo K. K.: *See*—
Kaminaga, Hiromitsu, 4,557,088, Cl. 52-235.000.

Yoshida, Muneo; and Tamura, Yoshitomo, to Asahi Kasei Kogyo Kabushiki Kaisha. Electrolytic cell with ion exchange membrane. 4,557,816, Cl. 204-255.000.

Yoshikawa, Kensei: *See*—
Hatayama, Katsuo; Yoshikawa, Kensei; Sano, Tatsuhiko; Ohuchi, Yutaka; Ota, Tomomi; Sekiuchi, Kazuto; and Sota, Kaoru, 4,557,871, Cl. 556-183.000.

Yoshikawa, Ryoichi: *See*—
Gotou, Mineo; Yoshikawa, Ryoichi; Tojo, Toru; and Wada, Hirotsugu, 4,558,225, Cl. 250-491.100.

Yoshikawa, Tomio: *See*—
Kato, Takashi; Yoshikawa, Tomio; Sato, Keiji; and Yoshioka, Kazuo, 4,557,114, Cl. 62-126.000.

Yoshioka, Kazuo: *See*—
Kato, Takashi; Yoshikawa, Tomio; Sato, Keiji; and Yoshioka, Kazuo, 4,557,114, Cl. 62-126.000.

Yoshitomi Pharmaceutical Industries, Ltd.: *See*—
Hanayama, Naoki; Kaku, Eisaburo; and Kinishi, Ryoichi, 4,558,335, Cl. 346-209.000.

Yoshizawa, Michisuke: *See*—
Takamiya, Sanshiro; Yoshizawa, Michisuke; and Suzuki, Akira, 4,556,997, Cl. 623-3.000.

Young, Bobby: *See*—
Cantwell, Thomas; Simon, William; and Young, Bobby, 4,557,139, Cl. 73-40.700.

Young, Ian R., to Picker International, Limited. Nuclear magnetic resonance methods and apparatus. 4,558,278, Cl. 324-309.000.

Young, Kenneth P.: *See*—
Kenney, Malachi P.; Young, Kenneth P.; and Koch, Alan A., 4,557,605, Cl. 366-134.000.

Youssefyeh, Raymond D.: *See*—
Skiles, Jerry W.; Youssefyeh, Raymond D.; Suh, John T.; and Jones, Howard, 4,558,038, Cl. 514-20.000.

Yurdin, Carl: *See*—
Sealfon, Andrew; and Yurdin, Carl, 4,557,728, Cl. 604-134.000.

Zabsky, John M.: *See*—
Croopnick, Gerald A.; and Zabsky, John M., 4,557,836, Cl. 210-287.000.

Zahner, Hans: *See*—
Hagenmaier, Hans-Paul; Werner, Gerhard; Drautz, Hannelore; Holst, Hartwig; Zahner, Hans; Brandes, Wilhelm; Reinecke, Paul; Zoebelein, Gerhard; Stendel, Wilhelm; Andrews, Peter; and Schaller, Klaus, 4,558,139, Cl. 349-271.000.

Zahnradfabrik Friedrichshafen, AG.: *See*—
Lang, Armin, 4,557,344, Cl. 180-143.000.

Zaidenweber, Gary A., to Medtronic, Inc. Digital frequency-modulated demodulation. 4,558,284, Cl. 329-126.000.

Zambias, Robert A.: *See*—
Thompson, Kathryn L.; Zambias, Robert A.; Hammond, Milton L.; and Chang, Michael N., 4,558,067, Cl. 514-458.000.

Zanardo, Agostino, to Aeritalia Societa Aerospaziale Italiana p.A. Extensible arm, particularly for space modules or vehicles. 4,557,083, Cl. 52-109.000.

Zansokhov, Leonid G.: *See*—
Kontar, Evgeny A.; Soloviev, Sergei L.; Brovko, Viktor P.; Glukhikh, Rudolf G.; Khomyakov, Evgeny N.; Pakhomov, Jury F.; Khmeljuk, Alexei M.; Vyalykh, Vladimir I.; Zansokhov, Leonid G.; Smertin, Valentin P.; Evseev, Alexei I.; and Sharipov, Fyarit A., 4,557,697, Cl. 441-2.000.

Zehnder, Walter: *See*—
Boschung, Marcel; and Zehnder, Walter, 4,557,420, Cl. 239-66.000.

Zengel, Hans-Georg; Bergfeld, Manfred; and Eisenhuth, Ludwig, to Akzona Incorporated. Process for the preparation of dithiazolyl disulfides. 4,558,135, Cl. 548-158.000.

Zenith Electronics Corporation: *See*—
Hendrickson, Melvin C.; and Sproston, Robert L., Jr., 4,558,360, Cl. 358-120.000.

Zentgraf, Helmut: *See*—
Fricke, Ganter; Geisler, Iring; and Zentgraf, Helmut, 4,557,827, Cl. 209-127.400.

Zetena, Maurice F. Wall recess cable connector permitting simplified interconnection and limiting protruding cables. 4,558,172, Cl. 174-66.000.

Zettler, Hans D.: *See*—
Berbner, Heinz; Seid, Bernhard; Voelker, Heinz; and Zettler, Hans D., 4,557,969, Cl. 428-283.000.

Zimmer, Johannes. Rotary-screen printer with magnetically attracted wiper. 4,557,194, Cl. 101-120.000.

Zimring, Bruce, to General Signal Corporation. Calibration and alignment target plate. 4,557,599, Cl. 356-243.000.

Zingg, Hanskonrad, to Ciba-Geigy Corporation. Applicator for "curtain-type pouring" of molten plastics and the like pourable materials. 4,557,217, Cl. 118-300.000.

Zingler, Christian J., to Electric Power Research Institute, Inc. Combined clamping and cutting system for moving filament. 4,557,423, Cl. 242-25.00R.

Zitzen, Wilhelm, to W. Schlafhorst & Co. Controllable and adjustable yarn tensioning device. 4,557,431, Cl. 242-150.00R.

Zoebelein, Gerhard: *See*—
Hagenmaier, Hans-Paul; Werner, Gerhard; Drautz, Hannelore; Holst, Hartwig; Zahner, Hans; Brandes, Wilhelm; Reinecke, Paul; Zoebelein, Gerhard; Stendel, Wilhelm; Andrews, Peter; and Schaller, Klaus, 4,558,139, Cl. 549-271.000.

Zola, Meyer J.: *See*—
Kennedy, James C.; Trimnell, Lawrence J.; and Zola, Meyer J., 4,558,444, Cl. 370-58.000.

Zoleski, Benjamin H.: *See*—
Sung, Rodney L.; Zoleski, Benjamin H.; Sweeney, William M.; and Crawford, Wheeler C., 4,557,848, Cl. 252-51.50R.

Zubarev, Alexei G.: *See*—
Mizin, Vladimir G.; Zubarev, Alexei G.; Kolganov, Gennady S.; Volkov, Stanislav S.; Rudnev, Jury A.; Ivashina, Evgeny N.; Blinov, Konstantin A.; and Jugov, Petr I., 4,557,758, Cl. 75-51.200.

Zuber, Pierre A.; and Dadpey, Habib, to Westinghouse Electric Corp. Vehicle speed control apparatus and method. 4,558,415, Cl. 364-426.000.

Zucker, Stanley, to Energy Absorption Systems, Inc. Inertial barrier. 4,557,466, Cl. 256-13.100.

Zust, Harry; and Burgi, Sigi. Contact insertable in a metallized hole of a printed circuit card and process. 4,557,539, Cl. 339-17.00C.

ZVS Vyzkumnevyvojovy Ustav Koncernova Ucelova Organizace: *See*—
Henzl, Jindrich; Kuda, Vladimir; Vasicek, Vladimir; and Klimes, Stanislav, 4,557,299, Cl. 139-452.000.

Zygo Industries, Inc.: *See*—
Weiss, Lawrence H.; and Tahayeri, Akbar, 4,558,315, Cl. 340-802.000.

4C Electronics, Inc.: *See*—
Forbes, Mel L.; and Venaleck, John T., 4,557,540, Cl. 339-17.0CF.

501 Evelyn Investments Ltd.: *See*—
Roberts, George E.; and Waddington, Robert L., 4,557,024, Cl. 24-20.0TT.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 10TH DAY OF DECEMBER, 1985

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Bayer Aktiengesellschaft: *See*—
Eimers, Erich; Dhein, Rolf; Cohnen, Wolfgang; Kuhle, Engelbert; and Heywang, Gerhard, Re. 32,046, Cl. 524-107.000.

Cohnen, Wolfgang: *See*—
Eimers, Erich; Dhein, Rolf; Cohnen, Wolfgang; Kuhle, Engelbert; and Heywang, Gerhard, Re. 32,046, Cl. 524-107.000.

Dhein, Rolf: *See*—
Eimers, Erich; Dhein, Rolf; Cohnen, Wolfgang; Kuhle, Engelbert; and Heywang, Gerhard, Re. 32,046, Cl. 524-107.000.

Eimers, Erich; Dhein, Rolf; Cohnen, Wolfgang; Kuhle, Engelbert; and Heywang, Gerhard, to Bayer Aktiengesellschaft. Solutions for stabilizing thermoplastic polycarbonates. Re. 32,046, Cl. 524-107.000.

Heywang, Gerhard: *See*—
Eimers, Erich; Dhein, Rolf; Cohnen, Wolfgang; Kuhle, Engelbert; and Heywang, Gerhard, Re. 32,046, Cl. 524-107.000.

Kuhle, Engelbert: *See*—
Eimers, Erich; Dhein, Rolf; Cohnen, Wolfgang; Kuhle, Engelbert; and Heywang, Gerhard, Re. 32,046, Cl. 524-107.000.

Schmanski, Donald W. Roadway/traffic delineator. Re. 32,045, Cl. 404-10.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Aluma Building Systems, Inc.: *See*—
Avery, Peter J., B1 4,156,999, Cl. 52-376.000.

Avery, Peter J., to Aluma Building Systems, Inc. Beam for concrete forming structures. B1 4,156,999, 12-10-85, Cl. 52-376.000.

Beecham Group p.l.c.: *See*—
Evans, John M.; Buckingham, Robin E.; and Willcocks, Kenneth, B1 4,446,113, Cl. 514-320.000.

Bloomfield, Rodger E., to General Motors Corporation. Catalytic converter having monolith with mica support means therefor. B1 3,966,419, 12-10-85, Cl. 422-179.000.

Buckingham, Robin E.: *See*—
Evans, John M.; Buckingham, Robin E.; and Willcocks, Kenneth, B1 4,446,113, Cl. 514-320.000.

Cinzori, Robert J.; and Stapleton, Gerald F., to Santa Barbara Research Center. Dual spectrum infrared fire detection system with high energy ammunition round discrimination. B1 3,825,754, 12-10-85, Cl. 250-338.000.

DeWitt, Robert E. Water sprinkler with flat plate pattern control. B1 4,281,793, 12-10-85, Cl. 239-11.000.

Evans, John M.; Buckingham, Robin E.; and Willcocks, Kenneth, to Beecham Group p.l.c. Benzopyrans. B1 4,446,113, 12-10-85, Cl. 514-320.000.

General Electric Company: *See*—
Maget, Henri J. R., B1 3,489,670, Cl. 204-129.000.

General Motors Corporation: *See*—
Bloomfield, Rodger E., B1 3,966,419, Cl. 422-179.000.

Kronmiller, Richard E.: *See*—
Meyer, Robert B.; Schaefer, Harold W.; and Kronmiller, Richard E., B1 4,249,281, Cl. 15-340.000.

Maget, Henri J. R., to General Electric Company. Process for gas purification. B1 3,489,670, 12-10-85, Cl. 204-129.000.

Meyer, Robert B.; Schaefer, Harold W.; and Kronmiller, Richard E., to National Union Electric Corporation. Self-propelled vacuum cleaner. B1 4,249,281, 12-10-85, Cl. 15-340.000.

National Union Electric Corporation: *See*—
Meyer, Robert B.; Schaefer, Harold W.; and Kronmiller, Richard E., B1 4,249,281, Cl. 15-340.000.

Santa Barbara Research Center: *See*—
Cinzori, Robert J.; and Stapleton, Gerald F., B1 3,825,754, Cl. 250-338.000.

Schaefer, Harold W.: *See*—
Meyer, Robert B.; Schaefer, Harold W.; and Kronmiller, Richard E., B1 4,249,281, Cl. 15-340.000.

Stapleton, Gerald F.: *See*—
Cinzori, Robert J.; and Stapleton, Gerald F., B1 3,825.754, Cl. 250-338.000.

Willcocks, Kenneth: *See*—
Evans, John M.; Buckingham, Robin E.; and Willcocks, Kenneth, B1 4,446,113, Cl. 514-320.000.

LIST OF DESIGN PATENTEES

Akabane, Jun, to Nippon Kogaku K.K. Camera case. 281,644, 12-10-85, Cl. D3-33.000.

Akiyama, Kunio, to Sharp Corporation. Combined point-of-sale cash register and support cabinet therefor. 281,702, 12-10-85, Cl. D18-4.000.

Alstead, Peder B. Reflex massager. 281,723, 12-10-85, Cl. D24-36.000.

American Hospital Supply Corporation: *See*—
Trudeau, Robert P.; and Gallagher, Abigail H., 281,660, Cl. D7-23.000.

American Standard Inc.: *See*—
Platner, Joseph W., 281,715, Cl. D23-61.000.

American Tourister, Inc.: *See*—
Bomes, Harvey; Pulichino, John; Barber, Jack; and Bell, Max, 281,645, Cl. D3-48.000.
Bomes, Harvey; Pulichino, John; Migliore, John; and Barber, Jack, 281,646, Cl. D3-71.000.
Bomes, Harvey; Pulichino, John; Migliore, John; and Barber, Jack, 281,647, Cl. D3-71.000.
Bomes, Harvey; Pulichino, John; Migliore, John; and Barber, Jack, 281,648, Cl. D3-71.000.
Bomes, Harvey; Pulichino, John; Migliore, John; and Barber, Jack, 281,649, Cl. D3-71.000.
Bomes, Harvey; Pulichino, John; Barber, Jack; and Bell, Max, 281,650, Cl. D3-71.000.
Bomes, Harvey; Pulichino, John; Barber, Jack; and Migliore, John, 281,651, Cl. D3-71.000.
Bomes, Harvey; Pulichino, John; Barber, Jack; and Migliore, John, 281,652, Cl. D3-71.000.

Anderson, Thomas. Backpack cargo frame or the like. 281,643, 12-10-85, Cl. D3-32.000.

Aseltine, David W. Fireplace stove facade unit. 281,716, 12-10-85, Cl. D23-128.000.

Augustin, Georg. Staple puller. 281,662, 12-10-85, Cl. D8-48.000.

Automation, Inc.: *See*—
Thomas, William J., 281,690, Cl. D14-102.000.

Baity, William E. Toothbrush. 281,653, 12-10-85, Cl. D4-108.000.

Balma S.p.A.: *See*—
Vitaloni, Alberto, 281,691, Cl. D15-9.000.

Banner, Alvin C.; Finegold, Hyman B.; and Seitz, David R., to Globe Tool & Engineering Company, The. Display cabinet for armature winding machines or the like. 281,697, 12-10-85, Cl. D15-138.000.

Barber, Jack: *See*—
Bomes, Harvey; Pulichino, John; Barber, Jack; and Bell, Max, 281,645, Cl. D3-48.000.

Bomes, Harvey; Pulichino, John; Migliore, John; and Barber, Jack, 281,646, Cl. D3-71.000.
Bomes, Harvey; Pulichino, John; Migliore, John; and Barber, Jack, 281,647, Cl. D3-71.000.
Bomes, Harvey; Pulichino, John; Migliore, John; and Barber, Jack, 281,648, Cl. D3-71.000.
Bomes, Harvey; Pulichino, John; Migliore, John; and Barber, Jack, 281,649, Cl. D3-71.000.
Bomes, Harvey; Pulichino, John; Barber, Jack; and Bell, Max, 281,650, Cl. D3-71.000.
Bomes, Harvey; Pulichino, John; Barber, Jack; and Migliore, John, 281,651, Cl. D3-71.000.
Bomes, Harvey; Pulichino, John; Barber, Jack; and Migliore, John, 281,652, Cl. D3-71.000.
Barnhart, William. Ice cube tray. 281,696, 12-10-85, Cl. D15-90.000.
Bartlett, Randall N.; Broadhead, James H.; and Wilbur, Lawrence A., to Syntex (U.S.A.) Inc. Seating unit for a patient's chair. 281,656, 12-10-85, Cl. D6-361.000.
Beatrice Companies, Inc.: *See*—
Mikol, Erwin F., 281,713, Cl. D23-19.000.
Beckman Instruments, Inc.: *See*—
Crotty, Daniel G.; and Brown, Hugh O., 281,664, Cl. D8-74.000.
Bell, Max: *See*—
Bomes, Harvey; Pulichino, John; Barber, Jack; and Bell, Max, 281,645, Cl. D3-48.000.
Bomes, Harvey; Pulichino, John; Barber, Jack; and Bell, Max, 281,650, Cl. D3-71.000.
Berard, Philippe, to Centrale Vinicole Lyonnaise. Packaging container for wine. 281,668, 12-10-85, Cl. D9-322.000.
Bladh, Tommy; and Hansson, Bill, to Fastighets AB Leif Eriksson. Device for removing lint from textile goods. 281,654, 12-10-85, Cl. D4-122.000.
Blatherwick, William J.: *See*—
Holewinski, Robert D.; Hamilton, Leslie; and Blatherwick, William J., 281,719, Cl. D24-16.000.
Bomes, Harvey; Pulichino, John; Barber, Jack; and Bell, Max, to American Tourister, Inc. Soft-sided tote bag. 281,645, 12-10-85, Cl. D3-48.000.
Bomes, Harvey; Pulichino, John; Migliore, John; and Barber, Jack, to American Tourister, Inc. Duffle luggage. 281,646, 12-10-85, Cl. D3-71.000.
Bomes, Harvey; Pulichino, John; Migliore, John; and Barber, Jack, to American Tourister, Inc. Duffle luggage. 281,647, 12-10-85, Cl. D3-71.000.
Bomes, Harvey; Pulichino, John; Migliore, John; and Barber, Jack, to American Tourister, Inc. Duffle luggage. 281,648, 12-10-85, Cl. D3-71.000.
Bomes, Harvey; Pulichino, John; Migliore, John; and Barber, Jack, to American Tourister, Inc. Duffle luggage. 281,649, 12-10-85, Cl. D3-71.000.
Bomes, Harvey; Pulichino, John; Barber, Jack; and Bell, Max, to American Tourister, Inc. Soft-sided wheeled suitcase. 281,650, 12-10-85, Cl. D3-71.000.
Bomes, Harvey; Pulichino, John; Barber, Jack; and Migliore, John, to American Tourister, Inc. Garment bag. 281,651, 12-10-85, Cl. D3-71.000.
Bomes, Harvey; Pulichino, John; Barber, Jack; and Migliore, John, to American Tourister, Inc. Soft-sided wheeled suitcase. 281,652, 12-10-85, Cl. D3-71.000.
Breyer-Lindner, Brigitte. Applique ornament or the like. 281,678, 12-10-85, Cl. D11-133.000.
Brinly-Hardy Co., Inc.: *See*—
Doering, Charles W., 281,693, Cl. D15-27.000.
Broadhead, James H.: *See*—
Bartlett, Randall N.; Broadhead, James H.; and Wilbur, Lawrence A., 281,656, Cl. D6-361.000.
Brown, Hugh O.: *See*—
Crotty, Daniel G.; and Brown, Hugh O., 281,664, Cl. D8-74.000.
Buchet, Marcel, to l'Oreal, S.A. Nail enamel container. 281,671, 12-10-85, Cl. D9-372.000.
Carrol, Alan, to Trenchbood Limited. Magnetizable rotor for liquid treatment apparatus. 281,722, 12-10-85, Cl. D24-29.000.
Carter, Roland, to Erwin-Lambeth, Inc. Chair. 281,655, 12-10-85, Cl. D6-334.000.
Centrale Vinicole Lyonnaise: *See*—
Berard, Philippe, 281,668, Cl. D9-322.000.
Chen, Lin-Fu. Computerized measuring machine for weight, height and temperature. 281,677, 12-10-85, Cl. D10-88.000.
Chrisdon, Inc.: *See*—
Pfeiffer, Harry J., Jr., 281,682, Cl. D13-25.000.
CK Marketing, Inc.: *See*—
Owens, Edward J., Jr., 281,688, Cl. D14-57.000.
Cressy-Renoma, Michel. Pair of trousers with removable pockets. 281,636, 12-10-85, Cl. D2-28.000.
Crotty, Daniel G.; and Brown, Hugh O., to Beckman Instruments, Inc. Portable rotor vise. 281,664, 12-10-85, Cl. D8-74.000.
Deacon, Rosa, to Syroco, Inc. Combined bulletin board, telephone book and pad holder. 281,704, 12-10-85, Cl. D19-52.000.
De Mourgues, Alain, to Hanorah Italiana S.P.A. Bottle for cosmetic products or the like. 281,672, 12-10-85, Cl. D9-385.000.
Dignan, Donald J.: *See*—
Weinerman, Lee S.; Rachocki, Michael J.; and Dignan, Donald J., 281,665, Cl. D8-302.000.
Disko, Harry: *See*—
Rivette, Denni F.; and Disko, Harry, 281,686, Cl. D14-53.000.
Doering, Charles W., to Brinly-Hardy Co., Inc. Pulled aerator. 281,693, 12-10-85, Cl. D15-27.000.
Doi, Tetsuyuki: *See*—
Tsuru, Hitoshi; and Doi, Tetsuyuki, 281,663, Cl. D8-66.000.
Durbin, Richard. Combined bag and supporting structure. 281,667, 12-10-85, Cl. D9-305.000.
Eastern Company, The: *See*—
Weinerman, Lee S.; Rachocki, Michael J.; and Dignan, Donald J., 281,665, Cl. D8-302.000.
Egnatski, Anne: *See*—
Egnatski, Gary, 281,700, Cl. D17-19.000.
Egnatski, Gary, to Egnatski, Anne. Guitar or the like. 281,700, 12-10-85, Cl. D17-19.000.
Erwin-Lambeth, Inc.: *See*—
Carter, Roland, 281,655, Cl. D6-334.000.
Fastighets AB Leif Eriksson: *See*—
Bladh, Tommy; and Hansson, Bill, 281,654, Cl. D4-122.000.
Fay, James P., Jr.: *See*—
Fay, James P., Sr.; and Fay, James P., Jr., 281,666, Cl. D9-300.000.
Fay, James P., Sr.; and Fay, James P., Jr., to Pro-Tex Limited Partnership. Dispenser for liquids or the like. 281,666, 12-10-85, Cl. D9-300.000.
Finegold, Hyman B.: *See*—
Banner, Alvin C.; Finegold, Hyman B.; and Seitz, David R., 281,697, Cl. D15-138.000.
Fukuda, Harumi, to Sharp Corporation. Sorter. 281,699, 12-10-85, Cl. D16-32.000.
Fuzita, Shosiro, to Nippon Rubber Co., Ltd. Shoe sole. 281,642, 12-10-85, Cl. D2-320.000.
Galitzine, Peter D.: *See*—
Rapp, Harold B.; and Galitzine, Peter D., 281,675, Cl. D10-40.000.
Gallagher, Abigail H.: *See*—
Trudeau, Robert P.; and Gallagher, Abigail H., 281,660, Cl. D7-23.000.
Gamm, Robert J., to Kangaroos U.S.A., Inc. Angle flapped pocketed athletic shoe. 281,639, 12-10-85, Cl. D2-309.000.
Gamm, Robert J., to Kangaroos U.S.A., Inc. Basketball Shoe. 281,640, 12-10-85, Cl. D2-310.000.
Globe Tool & Engineering Company, The: *See*—
Banner, Alvin C.; Finegold, Hyman B.; and Seitz, David R., 281,697, Cl. D15-138.000.
Gregg, James S.: *See*—
Winter, Roger D.; Gregg, James S.; and Skewis, Daniel R., 281,706, Cl. D20-43.000.
Gupta, Badri: *See*—
Pavlov, Todor; and Gupta, Badri, 281,717, Cl. D23-136.000.
Hafner, V. Walter: *See*—
Morris, Earl L.; Hafner, V. Walter; and Sally, Theodore J., 281,714, Cl. D23-49.000.
Hamilton, Leslie: *See*—
Holewinski, Robert D.; Hamilton, Leslie; and Blatherwick, William J., 281,719, Cl. D24-16.000.
Hanorah Italiana S.P.A.: *See*—
De Mourgues, Alain, 281,672, Cl. D9-385.000.
Hansson, Bill: *See*—
Bladh, Tommy; and Hansson, Bill, 281,654, Cl. D4-122.000.
Henderson, Charles. Airplane. 281,680, 12-10-85, Cl. D12-333.000.
Hiivola, Jouni J., to Tunturipyora Oy. Bicycle exerciser. 281,711, 12-10-85, Cl. D21-194.000.
Hitachi, Ltd.: *See*—
Hyuga, Hideyo; Ichikawa, Yukinobu; Kuroiwa, Yukio; Masatsugu, Shigeki; and Toyoda, Fumio, 281,684, Cl. D14-5.000.
Takahashi, Eiji; Mori, Mamoru; and Itoh, Takao, 281,685, Cl. D14-14.000.
Holewinski, Robert D.; Hamilton, Leslie; and Blatherwick, William J., to Johnson & Johnson Dental Products Company. Dental composite unit dose container with attached mixing stick. 281,719, 12-10-85, Cl. D24-16.000.
Holstad, Harald. Dental mirror. 281,718, 12-10-85, Cl. D24-13.000.
Hyuga, Hideyo; Ichikawa, Yukinobu; Kuroiwa, Yukio; Masatsugu, Shigeki; and Toyoda, Fumio, to Hitachi, Ltd. Combined video tape recorder and video camera. 281,684, 12-10-85, Cl. D14-5.000.
I.S.E.C. Ltd., Industrial Supplies and Engineering Co.: *See*—
Michiels, Christian, 281,724, Cl. D24-41.000.
Ichikawa, Yukinobu: *See*—
Hyuga, Hideyo; Ichikawa, Yukinobu; Kuroiwa, Yukio; Masatsugu, Shigeki; and Toyoda, Fumio, 281,684, Cl. D14-5.000.
Ingrid, Ltd.: *See*—
Ryan, Delvin R., Jr., 281,694, Cl. D15-77.000.
Ryan, Delvin R., Jr., 281,695, Cl. D15-77.000.
Innovative Time Corporation: *See*—
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NOTE.—First number, class; second number, subclass; third number, patent number

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115 4,557,284

CLASS 137

15 4,557,285
74 4,557,286
115 4,557,287
315 4,557,288
355.28 4,557,289
510 4,557,290
596.13 4,557,291
596.16 4,557,292
625.65 4,557,293
625.68 4,557,294
813 4,557,295

CLASS 138

44 4,557,296
141 4,557,297

CLASS 139

71 4,557,298
452 4,557,299

CLASS 141

5 4,557,300
4,557,301
207 4,557,302

CLASS 144

145 A 4,557,303
213 4,557,304
230 4,557,305

CLASS 148

4 4,557,765
11.5 P 4,557,766
23 4,557,767
24 4,557,768
31.55 4,557,769
437 4,557,770

CLASS 149

14 4,557,771

CLASS 152

427 4,557,308
539 4,557,307
548 4,557,306

CLASS 156

62 4,557,772
64 4,557,773
71 4,557,774
96 4,557,775
103 4,557,776
201 4,557,777
209 4,557,778
219 4,557,779
244.11 4,557,780
245 4,557,781
250 4,557,782
257 4,557,783
307.7 4,557,784
345 4,557,785
350 4,557,786
356 4,557,787
425 4,557,788
505 4,557,789
511 4,557,790
580 4,557,791
583.1 4,557,792
608 4,557,793
612 4,557,794
617 SP 4,557,795
643 4,557,796
4,557,797
660 4,557,798

CLASS 159

44 4,557,799

CLASS 160

84 R 4,557,309
4,557,310
330 4,557,311

CLASS 162

20 4,557,800
157.6 4,557,801
264 4,557,802

CLASS 164

34 4,557,312
155 4,557,313
287 4,557,314
420 4,557,315
517 4,557,316

CLASS 165

2	4,557,317
10	4,557,318
44	4,557,319
46	4,557,320
122	4,557,321
158	4,557,322
163	4,557,323
174	4,557,324

CLASS 166

97	4,557,325
212	4,557,326
241	4,557,327
256	4,557,328
261	4,557,329
274	4,557,330
297	4,557,331
345	4,557,332
374	4,557,333

CLASS 168

12	4,557,334

CLASS 172

44	4,557,335

CLASS 173

90	4,557,336
93.5	4,557,337
134	4,557,338

CLASS 174

52 FP	4,558,171
66	4,558,172
86	4,558,173
92	4,558,174

CLASS 175

325	4,557,339

CLASS 177

1	4,557,340
16	4,557,341

CLASS 178

22.08	4,558,175
	4,558,176

CLASS 179

2 E	4,558,178
2 EA	4,558,177
5 P	4,558,181
6.03	4,558,179
18 BC	4,558,180
81 R	4,558,182
84 A	4,558,183
111 R	4,558,184
170 NC	4,558,185
	4,558,186
170.2	4,558,187
175.2 D	4,558,188

CLASS 180

132	4,557,342
142	4,557,343
143	4,557,344
229	4,557,345
242	4,557,346
308	4,557,347

CLASS 181

120	4,557,348
279	4,557,349

CLASS 182

33	4,557,350

CLASS 184

18	4,557,351

CLASS 186

37	4,557,352

CLASS 187

2	4,557,353

CLASS 188

73.45	4,557,354
173	4,557,355
218 XL	4,557,356

CLASS 192

3.21	4,557,357
35	4,557,358
43	4,557,359
84 R	4,557,360
85 C	4,557,361
106.2	4,557,362
113 B	4,557,363

CLASS 193

25 C	4,557,364

CLASS 194

1 G	4,557,365
100 A	4,557,366

CLASS 198

313	4,557,367
	4,557,368
333	4,557,369
621	4,557,370
803.01	4,557,371
807	4,557,372
819	4,557,373
852	4,557,374

CLASS 200

1 V	4,558,189
5 A	4,558,190
	4,558,191
35 R	4,558,192
43.05	4,558,193
61.89	4,558,194
83 R	4,558,195

CLASS 202

227	4,557,804
270	4,557,805

CLASS 203

1	4,557,806

CLASS 204

4	4,557,807
29	4,557,808
59 QM	4,557,809
98	4,557,810
105 R	4,557,811
129	B1 3,489,670
130	4,557,812
159.14	4,557,813
181.7	4,557,814
182.2	4,557,815
255	4,557,816
286	4,557,817
288	4,557,818
298	4,557,819

CLASS 206

151	4,557,375
219	4,557,376
	4,557,377
223	4,557,378
328	4,557,379
387	4,557,380
440	4,557,381
444	4,557,382
521	4,557,383
554	4,557,384
620	4,557,385

CLASS 208

8 LE	4,557,820
108	4,557,803
	4,557,821
112	4,557,822
216 R	4,557,823
251 H	4,557,824

CLASS 209

3	4,557,825
11	4,557,826
127.4	4,557,827
214	4,557,828
556	4,557,386
636	4,557,387
671	4,557,388

CLASS 210

132	4,557,829
198.2	4,557,830
232	4,557,831
242.3	4,557,832
287	4,557,836
386	4,557,833
445	4,557,834
748	4,557,835

CLASS 211

13	4,557,389

CLASS 212

197	4,557,390
270	4,557,391

CLASS 215

11 R	4,557,392
253	4,557,393
317	4,557,394

CLASS 219

10.51	4,558,196
10.55 E	4,558,197
	4,558,198
85 CM	4,558,200
121 PM	4,558,201
137 WM	4,558,202
214	4,558,203
283	4,558,204
	4,558,205
301	4,558,206
308	4,558,207
399	4,558,208
530	4,558,209
535	4,558,210

CLASS 220

86 R	4,557,395
206	4,557,396
270	4,557,397
	4,557,398

CLASS 222

83.5	4,557,399
105	4,557,400
211	4,557,401
230	4,557,402
252	4,557,403
325	4,557,404
539	4,557,405
564	4,557,406

CLASS 223

96	4,557,407
99	4,557,408

CLASS 227

147	4,557,409
155	4,557,410

CLASS 228

56.3	4,557,411
155	4,557,412
183	4,557,413

CLASS 229

5.5	4,557,414
30	4,557,415

CLASS 232

24	4,557,416

CLASS 235

380	4,558,211
383	4,558,212

CLASS 236

46 R	4,557,417
49	4,557,418
93 R	4,557,419

CLASS 239

11	B1 4,281,793
66	4,557,420

CLASS 241

73	4,557,421

CLASS 242

1	4,557,422
25 R	4,557,423
41	4,557,424
47.5	4,557,436
55	4,557,425
	4,557,427
55.3	4,557,426
82	4,557,428
84.42	4,557,429
96	4,557,430
150 R	4,557,431
158 R	4,557,432
187	4,557,433
189	4,557,434
190	4,557,435

CLASS 244

3.21	4,557,437
60	4,557,438
63	4,557,439
129.4	4,557,440
	4,557,441
137 P	4,557,442
153 R	4,557,443
172	4,557,444

CLASS 248

27.1	4,557,445
65	4,557,446
74.1	4,557,447
75	4,557,448
160	4,557,449
162.1	4,557,450
187	4,557,451
214	4,557,452
287	4,557,453
422	4,557,454
496	4,557,455
499	4,557,456
544	4,557,457
553	4,557,458
571	4,557,459
642	4,557,460

CLASS 250

214 R	4,558,213
216	4,558,214
222.1	4,558,215
223 R	4,558,216
227	4,558,217
251	4,558,218
260	4,558,219
269	4,558,220
325	4,558,221
338	B1 3,825,754
353	4,558,222
374	4,558,223
461.1	4,558,224
491.1	4,558,225
551	4,558,226

CLASS 251

172	4,557,461
184	4,557,462
210	4,557,463
287	4,557,464

CLASS 252

8.55 C	4,557,837
	4,557,838
23	4,557,839
32.7 E	4,557,841
33.2	4,557,840
37.7	4,557,842
46.4	4,557,843
49.9	4,557,844
	4,557,845
51.5 A	4,557,846
	4,557,847
51.5 R	4,557,848
	4,557,849
68	4,557,850
70	4,557,851
95	4,557,852
128	4,557,853
174.15	4,557,854
355	4,557,855
500	4,557,856
503	4,557,857
508	4,557,858
511	4,557,859
512	4,557,860
627	4,557,861

CLASS 254

287	4,557,465

CLASS 256

13.1	4,557,466
59	4,557,467

CLASS 260

112 R	4,557,862
	4,557,863
112.5 R	4,557,864
239.3 P	4,557,866
239.3 T	4,557,865
239.5	4,557,867
245.89	4,557,868
349	4,557,869
404.8	4,557,870
504 A	4,557,872
513 R	4,557,873

CLASS 261

19	4,557,874
75	4,557,875
94	4,557,876
97	4,557,877
111	4,557,878
122	4,557,879

CLASS 264

22	4,557,880
40.4	4,557,881
	4,557,882
43	4,557,883
65	4,557,884
105	4,557,885
	4,557,886
216	4,557,887
230	4,557,888
320	4,557,889

CLASS 266

273	4,557,468

CLASS 267

20 A	4,557,469
64.12	4,557,470

CLASS 269

325	4,557,471

CLASS 271

133	4,557,472
229	4,557,473
301	4,557,474

CLASS 272

3	4,557,475
8 N	4,557,476
76	4,557,477
78	4,557,478
122	4,557,479
133	4,557,480

CLASS 273

1 GC	4,557,481
109	4,557,482
129 S	4,557,483
153 S	4,557,484
249	4,557,485
278	4,557,486

CLASS 277

12	4,557,487
27	4,557,488
65	4,557,489
80	4,557,490
212 FB	4,557,491
216	4,557,492

CLASS 280

91	4,557,493
164 R	4,557,494
213	4,557,495
402	4,557,496
403	4,557,497
615	4,557,498
626	4,557,499
669	4,557,500
673	4,557,501
756	4,557,502

CLASS 281

47	4,557,503

CLASS 283

68	4,557,504
81	4,557,505

CLASS 285

39	4,557,506
45	4,557,507
84	4,557,508
281	4,557,509
305	4,557,510

CLASS 290

40 R	4,558,227
52	4,558,228

CLASS 292

218	4,557,511
341.18	4,557,512

CLASS 294

1.1	4,557,513
64.1	4,557,514
67.22	4,557,515
143	4,557,516

CLASS 296

1 S	4,557,517
156	4,557,518
204	4,557,519

CLASS 297

185	4,557,520
285	4,557,521
452	4,557,522
468	4,557,523

CLASS 299

64	4,557,524
93	4,557,525

CLASS 301

124 R	4,557,526

CLASS 303

15	4,557,527
92	4,557,528

CLASS 307

17	4,558,229
66	4,558,230
271	4,558,231
351	4,558,232
362	4,558,233
446	4,558,234
450	4,558,235
465	4,558,236
475	4,558,237
491	4,558,238
494	4,558,239
530	4,558,240
	4,558,241
577	4,558,242
584	4,558,243

CLASS 308

3.8	4,557,531
4 R	4,557,529
6 C	4,557,530
	4,557,532

CLASS 310

49 R	4,558,244
67 R	4,558,245
87	4,558,246
	4,558,247
315	4,558,248
322	4,558,249

CLASS 312

12	4,557,533
201	4,557,534

CLASS 313

337	4,558,250
365	4,558,251
402	4,558,252
414	4,558,253
446	4,558,254
497	4,558,255

CLASS 315

3.5	4,558,256
5.38	4,558,257
5.39	4,558,258
82	4,558,259
	4,558,260
209 R	4,558,261
307	4,558,262

CLASS 318

139	4,558,263
254	4,558,264
561	4,558,265
571	4,558,266
696	4,558,267
	4,558,268
811	4,558,269

CLASS 320

2	4,558,270

CLASS 323

306	4,558,271
315	4,558,272

CLASS 324

54	4,558,273
60 CD	4,558,274
103 P	4,558,275
117 H	4,558,276
309	4,558,277
	4,558,278
315	4,558,279
399	4,558,280
433	4,558,281

CLASS 328

14	4,558,282
160	4,558,283

CLASS 329

126	4,558,284

CLASS 330

53	4,558,285
252	4,558,286
257	4,558,287
268	4,558,288
278	4,558,289

CLASS 333

126	4,558,290
138	4,558,291
173	4,558,292

CLASS 335

255	4,558,293
303	4,558,294

CLASS 336

83	4,558,295
100	4,558,296
213	4,558,297

CLASS 339

5 R	4,557,535
8 P	4,557,536
14 R	4,557,537
16 C	4,557,538
17 C	4,557,539
17 CF	4,557,540
17 LM	4,557,541
59 M	4,557,542
97 P	4,557,543
97 R	4,557,544
103 M	4,557,545
177 R	4,557,546
184 R	4,557,547
258 P	4,557,548
258 R	4,557,549

CLASS 340

19 R	4,558,298
81 R	4,558,299
286 M	4,558,300
347 AD	4,558,301
	4,558,303
347 DD	4,558,302
347 SY	4,558,304
384 E	4,558,305
520	4,558,306
527	4,558,307
550	4,558,308
649	4,558,309
661	4,558,310
680	4,558,311
	4,558,312
709	4,558,313
788	4,558,314

802 4,558,315
825.06 4,558,316
4,558,317
825.34 4,558,318
870.09 4,558,319
870.30 4,558,320
904 4,558,321

CLASS 343

17.2 R 4,558,322
458 4,558,323
754 4,558,324
765 4,558,325

CLASS 346

1.1 4,558,326
74.2 4,558,327
76 PH 4,558,328
4,558,329
4,558,330
4,558,331
140 R 4,558,332
4,558,333
159 4,558,334
209 4,558,335

CLASS 350

96.15 4,557,550
4,557,551
4,557,552
4,557,553
96.20 4,557,554
4,557,555
96.21 4,557,556
4,557,557
96.23 4,557,558
4,557,559
4,557,560
96.34 4,557,561
4,557,562
162.12 4,557,563
247 4,557,564
262 4,557,565
413 4,557,566
427 4,557,567
531 4,557,568
630 4,557,569

CLASS 353

81 4,557,055

CLASS 354

113 4,557,570
149.11 4,557,571
219 4,557,572
234.1 4,557,573
288 4,557,574
289.1 4,557,575
295 4,557,576
400 4,557,577
4,557,578
402 4,557,579
406 4,557,580

CLASS 355

1 4,557,581
3 DD 4,557,582
4,557,584
3 TR 4,557,583
8 4,557,585
11 4,557,586
14 C 4,557,587
14 R 4,557,588
14 SH 4,557,589
22 4,557,590
40 4,557,591
51 4,557,592
57 4,557,593
58 4,557,594
72 4,557,595
132 4,557,596

CLASS 356

71 4,557,597
241 4,557,598
243 4,557,599
246 4,557,600
320 4,557,601
372 4,557,602
418 4,557,603
432 4,557,604

CLASS 357

4 4,558,336
22 4,558,337
23.5 4,558,339
23.7 4,558,340
23.9 4,558,338
24 4,558,341
30 4,558,342
51 4,558,343
59 4,558,344
68 4,558,345
74 4,558,346

CLASS 358

11 4,558,347
13 4,558,348
16 4,558,349
21 R 4,558,350
28 4,558,351
31 4,558,352
36 4,558,353
37 4,558,354
74 4,558,355
75 4,558,356
4,558,357
86 4,558,358
89 4,558,359
120 4,558,360
136 4,558,361
138 4,558,362
164 4,558,363
188 4,558,364
212 4,558,365
213 4,558,366
227 4,558,367
228 4,558,368
257 4,558,369
260 4,558,370
261 4,558,371
264 4,558,372
285 4,558,373
287 4,558,374
342 4,558,375

CLASS 360

10.1 4,558,376
4,558,377
19.1 4,558,378
32 4,558,379
53 4,558,380
77 4,558,381
4,558,382
4,558,383
94 4,558,384
126 4,558,385
128 4,558,386
132 4,558,387
135 4,558,388

CLASS 361

88 4,558,389
119 4,558,390
155 4,558,391
253 4,558,392
286 4,558,393
306 4,558,394
385 4,558,395
399 4,558,396
404 4,558,397
415 4,558,398
433 4,558,399

CLASS 362

222 4,558,400
290 4,558,401
293 4,558,402
806 4,558,403

CLASS 363

37 4,558,404
81 4,558,405
126 4,558,406
132 4,558,407

CLASS 364

130 4,558,408
200 4,558,409
4,558,410
4,558,411
4,558,412
300 4,558,413
424.1 4,558,414
426 4,558,415
431.11 4,558,416
4,558,417
450 4,558,418
474 4,558,419
476 4,558,420
477 4,558,421
480 4,558,422
501 4,558,423
513 4,558,424
555 4,558,425
580 4,558,426
708 4,558,427
900 4,558,428
4,558,429
4,558,430

CLASS 365

45 4,558,431
154 4,558,432
189 4,558,433
4,558,434
203 4,558,435
230 4,558,436

CLASS 366

134 4,557,605

CLASS 367

15 4,558,437
71 4,558,438
127 4,558,439

CLASS 368

204 4,557,606

CLASS 369

13 4,558,440
59 4,558,441
126 4,558,442
139 4,558,443

CLASS 370

58 4,558,444
84 4,558,445

CLASS 371

10 4,558,446
71 4,558,447

CLASS 372

44 4,558,448
4,558,449
87 4,558,450
89 4,558,451
99 4,558,452

CLASS 374

121 4,557,607
170 4,557,608

CLASS 375

1 4,558,453
18 4,558,454
112 4,558,455

CLASS 376

282 4,557,890
397 4,557,891
412 4,557,892

CLASS 377

25 4,558,456
107 4,558,457

CLASS 378

20 4,558,458

CLASS 381

43 4,558,459
86 4,558,460

CLASS 382

9 4,558,461
42 4,558,462

CLASS 383

75 4,558,463

CLASS 384

94 4,557,609
107 4,557,610
124 4,557,611
488 4,557,612
568 4,557,613
573 4,557,614

CLASS 400

54 4,557,615
120 4,557,616
208 4,557,617

CLASS 401

34 4,557,618
190 4,557,619
200 4,557,620

CLASS 403

16 4,557,621
31 4,557,623
388 4,557,622

CLASS 404

10 Re.32,045
14 4,557,624
25 4,557,625
90 4,557,626

CLASS 405

146 4,557,627
191 4,557,628
204 4,557,629
232 4,557,630
259 4,557,631
267 4,557,632
268 4,557,633
286 4,557,634
296 4,557,635

CLASS 406

19 4,557,636
153 4,557,637
186 4,557,638

CLASS 407

20 4,557,639

CLASS 408

27 4,557,640
204 4,557,641
239 R 4,557,642

CLASS 409

136 4,557,643
143 4,557,644
144 4,557,645
218 4,557,646

CLASS 410

58 4,557,647
78 4,557,648

CLASS 411

40 4,557,649
108 4,557,650
181 4,557,651
230 4,557,652
337 4,557,653
431 4,557,654

CLASS 414

32 4,557,655
43 4,557,656
180 4,557,657
330 4,557,698
517 4,557,658
627 4,557,659
730 4,557,660
4,557,661
744 R 4,557,662
751 4,557,663

CLASS 415

105 4,557,664
158 4,557,665

CLASS 416

32 4,557,666

CLASS 417

50 4,557,667
259 4,557,668
271 4,557,669
299 4,557,670
328 4,557,671
360 4,557,672
412 4,557,673

CLASS 418

15 4,557,674
55 4,557,675
61 B 4,557,676
63 4,557,677
180 4,557,678
201 4,557,679

CLASS 419

12 4,557,893
67 4,557,894

CLASS 420

587 4,557,895

CLASS 422

14 4,557,896
15 4,557,897
28 4,557,898
55 4,557,899
4,557,900
56 4,557,901
59 4,557,902
101 4,557,903
146 4,557,904
179 B1 3,966,419

CLASS 423

27 4,557,905
49 4,557,906
119 4,557,907
164 4,557,908
167 4,557,909
206 T 4,557,910
228 4,557,911
242 4,557,912
279 4,557,913
303 4,557,914
319 4,557,915
328 4,557,916
4,557,917
329 4,557,919
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